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LOGISTIC SUPPORT
IN THE VIETNAM ERA

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MONOGRAPH 1

ADVANCED BASE
FACILITIES MAINTENANCE

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A REPORT
BY THE JOINT LOGISTICS REVIEW BOARD



OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE
WASHINGTON, D.C. 20301

18 DEC 1970

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INSTALLATIONS AND LOGISTICS

MEMORANDUM FOR THE DIRECTOR, DEFENSE DOCUMENTATION CENTER

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As stated

PAUL H. RILEY
Deputy Assistant Secretary of Defense
(Supply, Maintenance & Services)

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CHAPTER I

INTRODUCTION

CHAPTER I INTRODUCTION

1. **BASIS FOR STUDY.** A wide variety of important support and services are performed under the function variously described as repairs and utilities, public works, base maintenance, facilities engineering, and facilities maintenance. Included are the operation of utilities; maintenance of roads, airfields and other facilities; repair of battle damage; and emergency construction. Because of the importance of these activities in the Vietnam conflict, the Joint Logistics Review Board decided to treat this as a subject by itself rather than as a part of construction.

2. SIGNIFICANCE

a. The extensive nature of the facilities maintenance that would be required in Vietnam was not foreseen in advance. This extensiveness resulted from a combination of factors: the country-wide combat operations, the use of main bases or enclaves from which operations radiated, guerrilla activities, the length of the conflict and the amount of more permanent construction, and the undeveloped nature of the country. Thus the requirements for facilities maintenance support greatly exceeded that encountered in prior wars.

b. By mid-1968, the facilities construction program totaled more than \$1.5 billion. These facilities included bases for sophisticated jet aircraft, extensive communications systems, modern medical facilities, and controlled environments for automatic data processing (ADP) and other complicated, high-cost equipment. Although classed as temporary construction, these facilities generated much greater demands for utilities, particularly electricity, than in prior wars. In addition, the policy of making available large quantities of comfort items (such as toasters, television sets, and air conditioners) through the exchange system to reduce the inflationary aspects of U.S. troops' buying power on the Republic of Vietnam (RVN) economy¹ generated large unprecedented and unanticipated requirements for electrical generators and distribution systems that had to be operated and maintained.

c. The construction of each new facility resulted in a concurrent requirement for maintenance, thus requiring more and more maintenance capability and, in many cases, more effort to maintain and keep in satisfactory condition than to construct the facilities. Planning the development of maintenance capabilities, which eventually resulted in a peak force in excess of 41,000, was complicated by the graduated buildup of the U.S. forces.

d. Several aspects of facilities maintenance in the RVN conflict were peculiar to normal operations. One of the unique operations of the RVN conflict has been the vital, continuing involvement of civilian contractor personnel in facilities maintenance and operations in the combat area. This was due to the shortage of maintenance troops caused by the decision to prohibit full-scale mobilization of reserve and national guard forces and the stringent in-country military personnel ceilings.

e. Limited numbers of military units, however, had to be utilized for facilities maintenance, since contractor forces could not be deployed everywhere in the combat zone and were subject to curfews and strikes, which made them unavailable. The Navy's use of Public Works Seabees and Construction Battalion Maintenance Units (CBMUs); the Army's use of engineer utility detachments; and the Air Force's use of the Prime BEEF (Base Engineer Emergency Forces) and Rapid Engineer Deployable Heavy Operations Repair Squadrons, Engineer (RED HORSE) units greatly facilitated maintenance in the less secure forward areas or when civilian

¹Admiral U. S. G. Sharp, USN, and General W. C. Westmoreland, USA, Report on the War in Vietnam (Washington, D. C.: U. S. Government Printing Office, 1968), p. 119.

FACILITIES MAINTENANCE

maintenance forces were reduced in strength because of curfews, attacks, strikes, or other emergency conditions.

f. Another unusual aspect developed from the enclave pattern of fighting in RVN, in which the combat troops conducted tactical operations from fixed bases. This pattern called for positioning extensive facilities maintenance support organizations in forward areas to support requirements of combat troops. This introduced the principle of one-Service dominant-user facilities maintenance support on an area basis, principally through the use of Interservice Support Agreements (ISSA).

g. During the early buildup phase in 1965 and 1966, much of the capability of the facilities maintenance forces was utilized for minor new construction projects rather than strictly maintenance work. This is understandable owing to the constantly changing requirements for facilities and the relative cumbersomeness of integrating the myriad of urgent projects (less than \$25,000 cost per project) into the tremendous construction execution program. Although these small urgent projects could be placed in the overall construction priority list, in practice it was not feasible to divert contractor or troop construction forces from large urgent jobs to accomplish small urgent jobs of equal priority; consequently, few of the small projects were accomplished in this manner. Utilizing organic maintenance forces for minor construction, the base commander could obtain urgently needed facilities in a time-sensitive manner.

3. **STUDY OBJECTIVES.** The objectives of this monograph are to review the overall facilities maintenance and related services effort from the viewpoint of responding to the requirements of the RVN contingency and to determine how facilities maintenance and related services requirements can best be provided for future contingencies.

4. **SCOPE OF THE REVIEW**

a. The scope consists of the review and analysis of functions classified as public works by the Navy, those classified as base maintenance by the Air Force, those classified as facilities engineering by the Army, and those classified as facilities maintenance by the Marine Corps; and is restricted to activities of the United States and other Free World Military Assistance Forces (FWMAF) in Vietnam, except for a brief commentary on facilities maintenance in Thailand. It includes the maintenance and alteration of constructed and leased facilities, the accomplishment of minor new construction projects, the operation of utility systems, and related services. Special emphasis will be given to Service responsibilities and the use of interservice support, with due regard for recognition of individual service-peculiar requirements.

b. The public works function in the Navy, in addition to including all of the functions associated with facilities maintenance that are within the purview of the counterpart organization in the Army and Air Force, also includes the important functions of transportation and telephone service. Because they are not compatible with procedures utilized by the other Services, these two functional areas will not be included in this study.

5. **ORGANIZATION OF MONOGRAPH**

a. Chapter II discusses the basic assignment of responsibilities for facilities maintenance and methods of accomplishment and summarizes the situation with regard to Southeast Asia.

b. Chapter III reviews the adequacy of facilities maintenance considerations in contingency plans for Southeast Asia and the capabilities as of the start of the buildup.

c. Chapter IV reviews the actions taken to satisfy requirements that developed during the Vietnam buildup.

d. Chapter V discusses the impact of statutory and regulatory constraints.

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e. Chapter VI assesses the responsiveness and effectiveness of facilities maintenance in Vietnam, and Chapter VII provides an overall summary.

f. Strengths, weaknesses, and lessons learned are discussed throughout the monograph. Problem areas are identified and recommendations developed with the goal of improvement in readiness for and effectiveness, responsiveness, and economy in future combat situations.

CHAPTER II
FACILITIES MAINTENANCE RESPONSIBILITY

CHAPTER II

FACILITIES MAINTENANCE RESPONSIBILITY

1. BACKGROUND

a. The basic function of preparing joint logistics plans and assigning logistic responsibilities to the military services in accordance with those plans rests with the Joint Chiefs of Staff (JCS).¹ To provide the Services with a consolidated reference document, the Joint Chiefs of Staff issued a joint logistics and personnel policy and guidance publication.² It is a compilation of logistic and personnel policies and guidelines extracted from Department of Defense (DOD) directives, instructions, or transmittals; appropriate joint Service regulations and instructions; and papers approved by the Joint Chiefs of Staff.

b. Chapter 3 of JCS Pub. 3 sets forth the policies and responsibilities for maintenance and repair. Paragraph 030103 c(2) states (in part): "Each of the Services is responsible for providing or arranging for the provision of logistic means for the maintenance and repair of facilities, utilities, and routes, using the guidance stated herein."

c. The JCS Pub. 3 gives specific responsibility to each of the Services providing maintenance of facilities, utilities, and routes for which each has operating responsibilities. Each Service has responsibility for joint-use facilities when assigned.

d. Paragraph 030102c further provides that:

"(1) Permanent facilities will be maintained in wartime to the minimum degree necessary to protect the best interest of the Government and to insure reliable efficient operation.

"(2) Temporary facilities will be maintained to the minimum degree necessary to insure reliable efficient operation

"(3) Programs of preventive maintenance will be carried out at installations so as to reduce to a minimum large maintenance and restoration projects.

"(4) Maintenance efforts will not be diverted to projects which merely improve appearance and convenience of facilities.

"(5) Materials used in the maintenance of facilities will not be above the quality of materials used in the original construction except when necessary to improve reliability, efficiency, or to meet unforeseen operating emergencies."

e. The most comprehensive definition of facilities maintenance is that contained in a U.S. Army study.³ It referred to facilities engineering, a term that describes facilities maintenance as follows:

"Facilities engineering encompasses the management, operation and maintenance of the physical plant of Army installations so that each may fulfill its military mission at least possible cost and adequately safeguard public property and the safety, health, welfare and morale of personnel. The tasks performed are:

¹Department of Defense Directive 5100.1, Functions of the Department of Defense and Its Major Components, 31 December 1958, sec. IV, par. 3.

²JCS Pub. 3, Joint Logistics and Personnel Policy and Guidance (U), April 1969 (CONFIDENTIAL).

³Department of the Army, Military Engineering in Support of U.S. Army 1967-1975, February 1968 (FOUO).

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"(1) Maintenance, repair and, as required, modification, alteration or rehabilitation of structures, roads, railroads, airfield facilities, ranges, training areas, recreational facilities and other grounds.
"(2) Procurement and distribution, including the sale, of utilities services.
"(3) Operation, maintenance and repair of utilities systems and plants, including power, heat, refrigeration, air conditioning, water and sewerage.
"(4) Fire prevention and protection, refuse collection and disposal, entomological services, custodial services, packing and crating.
"Collectively the above functions comprise the real property maintenance activities (RPMA) program of the Army. Execution of this program is the responsibility of command; performance is accomplished by the facilities engineering (Post Engineer) organization of each installation."

f. The following definitions are considered essential for a clear understanding of the overall problem:

- (1) **Maintenance**—The recurrent day to day, periodic, or scheduled work required to preserve or restore a real property facility so that it may be used effectively for its designated purpose.
- (2) **Repair**—Restoration of a real property facility or components thereof to such condition that it may be used effectively for its designated purpose, by overhaul, reprocessing, or replacement of constituent parts or materials that have deteriorated by action of the elements or wear and tear in use and which cannot be corrected through maintenance.
- (3) **Alteration**—The work required to adjust interior arrangements, on-base location, or other physical characteristics of an existing facility so that it may be more effectively adapted or utilized for its designated purpose. Additions, expansions, or extensions are not included."⁴

g. The definition in paragraph e (above) adequately describes the performance of the maintenance of real property function of the other Services except as noted below:

- (1) **Navy**—The public works officer is additionally responsible for the maintenance and operation of transportation and land line communication equipment but is not responsible for packing and crating. The public works officer is not responsible for actual fire fighting operations but he is responsible for fire protection engineering.
- (2) **Marine Corps**—The maintenance officer is responsible for all the listed functions at Marine Corps activities except Marine Corps Air Stations where the functions are performed, as in the Navy, by a Navy public works officer.
- (3) **Air Force**—The base civil engineer (BCE) is not responsible for packing and crating.

h. In the final analysis, the task of the engineers in each of the Services is essentially the maintenance and repair of the real property facilities that make up a post, base, or station and the operation of the utility systems thereon. Lt. Gen. Lincoln, USA (Ret.), once described the Army post engineer mission as one that will ensure the installation is a place where people can live and work with efficiency, in dignity, and in comfort to achieve the Army's total mission.⁵ Although General Lincoln's specific comment applied to the Army, it is equally applicable to the other Services.

⁴U. S. Air Force Regulation 85-6, Real Property Maintenance, Repair, and Construction, 20 August 1969.

⁵U. S. Army Special Study, Total Management of Real Property Maintenance Activities, December 1968, p. IV.

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2. NORMAL METHOD OF ACCOMPLISHMENT

a. All the Services accomplish their normal peacetime function of maintenance of real property facilities in much the same fashion. They use essentially a civilian work force augmented in the case of the Navy, Marine Corps, and Air Force with specially trained enlisted personnel.

b. A DOD directive⁶ sets forth a statement of policy pertaining, among other things, to the use of military personnel for maintenance, repair, alteration, and new construction of real property in DOD within the continental United States (CONUS). This directive is permissive pertaining to unit and individual training for the purpose of maintaining competence in recognized trade skills. The directive is restrictive in that unit integrity must be maintained and projects undertaken must clearly contribute to training for a wartime mission. It also clearly states the DOD policy of not using enlisted personnel in competition with civilian labor.

c. The Army interpreted this directive as prohibiting the utilization of enlisted personnel in its post engineer activities in view of the existence of engineer construction battalions that could be used as a training base.

d. The Navy established a limited number of billets within its CONUS organizational structure to provide shore duty for Seabees who would otherwise be required to spend an inordinate amount of time at overseas locations. The Navy depends on its mobile construction battalions to provide a training base.

e. The Marine Corps also has a limited number of billets that are utilized to maintain individual proficiency in the technical skills and thus provide a rotation base for assignment to Fleet Marine Forces (FMF).

f. The Air Force, interpreting the directive differently than the other Services, mans approximately 45 percent of its CONUS facilities maintenance spaces with enlisted personnel. These personnel assigned to and actively engaged in facilities maintenance tasks are ready and trained for response to contingencies on a worldwide basis. They comprise the Air Force Prime BEEF (Base Engineer Emergency Forces) program, which constitutes an in-being solution to the necessity for an expanded, trained, active duty maintenance troop base. Thus the Air Force was in a unique position among the Services by having a force in being that was rapidly deployed to Vietnam to assist in accomplishing the facilities maintenance function.

3. THE VIETNAM SITUATION

a. A large percentage of the Air Force effort in the Vietnam conflict was launched from air bases located in Thailand. The other Services also had personnel in Thailand but in much fewer numbers than the Air Force. Facilities maintenance requirements for Thailand installations were similar to and handled in the same manner as for Vietnam installations. The same problems and difficulties inherent to facilities maintenance were encountered in Thailand as in Vietnam but on a smaller scale than in Vietnam. Therefore, research was concentrated on the situation as it occurred in Vietnam.

b. By 1 January 1965 total U.S. military personnel in Vietnam had grown to nearly 24,000, consisting of 900 Marines and more than 14,000 Army, 7,000 Air Force, and 1,000 Navy. The Navy utilized 600 of its personnel in providing logistic support to the other Services in fulfillment of its Military Advisory and Assistance Group (MAAG) administrative agency responsibilities, and the remainder of the U.S. personnel were primarily advisors to the Vietnamese Armed Forces.

⁶DOD Directive 1135.2, Procurement of Services for the Maintenance, Repair, Alteration, and Construction of Real Property, 5 August 1952.

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c. As administrative agency for countries in the area of responsibility of the Commander in Chief, Pacific (CINCPAC), the Navy was responsible in Vietnam for providing administrative and logistic or common support—defined as personnel, facilities, equipment, materials, and other services necessary for MAAG to carry out assigned responsibilities. Included were morale, welfare, and recreation activities; exchanges and other nonappropriated fund activities; commissary and postal facilities, health services, organizational clothing and equipment, food service, mess equipment and other table of allowance items not peculiar to one military department; minor new construction; operation of U.S. Government schools; and providing or arranging for supply and property accounting.

d. As of 1 January 1965 these responsibilities were carried out under the Secretary of the Navy through the Chief of Naval Operations (CNO) fleet chair of command. Under Commander, Service Force, U.S. Pacific Fleet, the Headquarters, Support Activity, Saigon (HSAS), was charged with the following mission: "To provide administrative and logistic support to the Headquarters, U.S. Military Assistance Command, Vietnam; U.S. Military Assistance Advisory Group, Vietnam; and other activities and units as designated by the Chief of Naval Operations."⁷

e. As the buildup continued each of the Services responded differently to the requirement for facilities maintenance support. The Army provided such support by contract and has continued to do so. The Navy continued to provide support for all Services located in II, III, and IV Corps Tactical Zones (CTZ) through HSAS until this responsibility was transferred to the Army in early 1966. The Air Force used temporary duty (TDY) teams from within the Pacific Air Forces (PACAF) augmented by Prime BEEF teams until permanent BCE organizations could be established.

4. SCOPE OF THE VIETNAM EFFORT

a. The relatively austere camps, airfields, and logistic support depots, which were the rule during World War II and the Korean War, were supplanted in Vietnam by base camps, airfields, and logistic support facilities in a number of so-called secure enclaves constructed to a higher standard than had been authorized in those earlier conflicts. Previously those relatively austere facilities were maintained by the combat troops on a self-help basis and relocated or abandoned as the battle line advanced. Owing to the higher standard and thus greater complexity of facilities in Vietnam and the nature of the battlefield, it was necessary to provide a force to maintain the facilities and to operate the more complicated utility systems while the combat troops prosecuted the war effort. However, self-help was utilized to a significant extent by all Services throughout Vietnam to augment the regularly assigned maintenance force.

(1) Army

(a) Prior to 1965, the only Army requirement for facilities maintenance was to support six Military Assistance Command, Vietnam (MACV), advisor sites. In view of this small requirement and based on experience in the accomplishment of facilities maintenance in Korea by contract, the Army decided on the contract route in Vietnam and solicited competitive proposals from 11 sources; seven firms responded. Final negotiations were conducted with four of the seven firms. Included in these four firms was Pacific Architects and Engineers (PA&E), the same firm with which the Army had a contract in Korea.

(b) The first contract for facilities maintenance in Vietnam was signed with PA&E on 1 May 1963 on a cost plus fixed fee basis. The contract required the contractor to organize his management and work force along the lines of the repairs and utilities organizations provided for in Army regulations and to provide facilities maintenance and related services for Army units located throughout Vietnam.

⁷ SECNAV Notice 5450, 18 June 1962.

FACILITIES MAINTENANCE

(c) The large-scale deployment of troops to Vietnam in 1965 resulted in immediate requirements for extensive construction of facilities throughout Vietnam with the concurrent requirement for maintenance of these facilities and the provision of ancillary services.

(d) As mentioned earlier the Navy had been providing support for all Services in Vietnam through HSAS. As the buildup of 1965 continued, it became apparent that the Army would soon become the dominant user in II, III, and IV CTZ and would therefore logically become responsible for common support. The fact that the Army contract was not limited to the six advisor sites for which the Army had responsibility facilitated expansion of the contract to satisfy the Army's growing requirement. The transfer of support responsibility from the Navy to the Army occurred on a phased basis between October 1965 and April 1966.

(e) As the Service with primary logistic responsibility for II, III, and IV CTZ after the establishment of the 1st Logistical Command in the fall of 1965, the Army was responsible for maintenance of its own facilities as well as for the provision of a limited amount of facilities maintenance support to the Navy and the Air Force. A major additional Army responsibility was the assumption of the logistic support, including facilities maintenance, of MACV elements, which had previously been provided by the Navy's Headquarters, Support Activity, Saigon.⁸

(2) Navy and Marine Corps

(a) When the Marines landed at Da Nang in 1965, no specific allowance was made for facilities maintenance. This was consistent with the concept that a Marine landing force is self-sufficient for a limited period of time for independent combat operations. Thus, the initial assignment of logistic support responsibilities in I CTZ to CINCPACFLT by CINCPAC⁹ did not extend to the maintenance of facilities.

(b) The planning associated with the decision of the Secretary of the Navy on 17 July 1965 to establish the Naval Support Activity (NSA), Da Nang, made allowance for a public works department with a relatively small staff sufficient only for the Navy facilities in I CTZ as then envisaged.¹⁰

(c) As the Navy responsibility for public works support was expanded at NSA, Da Nang, contract augmentation of the military, civil service, and direct-hire local national (LN) personnel became a necessity. Consequently, the Navy entered into a cost plus award fee contract with Philco-Ford to provide an augmentation to the NSA, Da Nang, public works effort by making available scarce personnel resources, i.e., administrative and technical U. S. personnel and South Korean nationals for unavailable in-country skills. Recruiting by the local military command to acquire professional U. S. civil service and Vietnamese skilled personnel had proved to be very difficult with unsatisfactory results. (Chapter IV of the Maintenance Monograph discusses a similar problem.)

(d) The initial FY 67 contract with Philco-Ford amounted to approximately \$4 million; in FY 68 it had increased to approximately \$21 million; and the FY 69 cost was approximately \$36 million. As the cost of the contract increased, the fixed fee dropped from 4 to 2.4 percent and the maximum award fee decreased from 4 to 3 percent.¹¹

⁸ COMSERVPAC, Operations of Service Forces, U. S. Pacific Fleet, Fiscal Year 1966 (U), p. 5-1 (CONFIDENTIAL).

⁹ CINCPAC, Message 241945Z, April 1965, subject: Operation of U. S. Military Ports, Beaches and Depots From Chu Lai to DMZ (SECRET).

¹⁰ COMSERVPAC, Plan for the Establishment of a Naval Support Activity, Da Nang, 18 July 1965, encl. 9, p. 2 (CONFIDENTIAL).

¹¹ Naval Facilities Engineering Command, Briefing to Assistant Deputy Chief of Naval Operations (Logistics), subject: Continuation of Philco-Ford Contract, 4 December 1968.

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(3) Air Force

(a) Although the Army and the Navy had responsibility for general logistic support throughout Vietnam, the Air Force retained primary responsibility for its facilities maintenance. At some of its bases the Air Force had complete responsibility; at others the responsibility was jointly shared with the other Services or with the Vietnamese Air Force.

(b) The Air Force had in being at the start of the force buildup essentially the same organizational force for facilities maintenance it was to use throughout the war. A capability for facilities maintenance is an integral part of Air Force tactical units (e.g., a civil engineering squadron is organic to an Air Force wing).

(c) In 1964, the Air Force recognized the need to bolster the civil engineering operations and maintenance forces in Vietnam, and civil engineering officers and airmen with appropriate skills were sent to Vietnam to serve as a nucleus for permanent civil engineering squadrons. Authority was also obtained to hire LNs to augment the squadrons' capabilities.

(d) The start of 1965 saw the Air Force with a viable civil engineering capability at each of its existing bases and plans for those on which construction was not yet completed. The base forces were augmented by the use of Prime BEEF teams on a TDY basis.

CHAPTER III
PLANNING AND READINESS

CHAPTER III

PLANNING AND READINESS

1. BACKGROUND

a. Logistics planners could not have foreseen the tremendous task that facilities maintenance, including the operation of vital utilities systems, was to become in Vietnam. The protracted nature of the conflict and the subsequent base stability that evolved resulted in the expenditure of millions of dollars and requirements for 11,000 military and 34,500 civilian personnel to perform the resultant facilities maintenance functions. Although the responsibility for such maintenance rests with the individual Services, as discussed in the previous chapter, none could have predicted in 1964 that their real property inventory would increase to the level reached in the years 1965 to 1969.

b. By the close of 1964, the Services depended largely on civilian work forces to perform their worldwide facilities maintenance requirements. Most of these requirements were being performed by direct-hire civilians, with some services (such as custodial and refuse collection) being performed by contract, and most minor construction and major repair projects by contract. The trend toward civilianization of these tasks limited the ability of the Services to respond to facilities maintenance requirements with military personnel. The Air Force had a more equitable mix of civilian and military facilities maintenance forces; consequently it was able to respond to overseas requirements in a more timely fashion.

c. This was the environment in which our facilities maintenance planning and readiness were shaped preceding the Vietnam buildup.

2. DISCUSSION. This chapter discusses facilities maintenance planning and readiness up to 1 January 1965.

a. A review of the applicable contingency plans in effect at the commencement of the Vietnam buildup reveals that facilities maintenance was addressed only in the broadest of terms, if at all. In some instances it was dismissed with reference to JCS Pub 3.¹

b. The resources necessary to satisfy the facilities maintenance requirements of an operation are relatively easy to compute if base development plans are adequate. In any military operation there will be requirements for water supply, electrical power, sanitation, shelter for personnel, and facilities for command, administrative, and logistic functions to some degree. Some support requirements will vary with the tactical or combat situation as it affects fire fighting or hospital utilities, and the climate as it affects heating, air conditioning, and refrigeration. Other variables include the size and expected duration of the operation and the state of development of the objective area (underdeveloped country, developed country, metropolitan area, or some combination thereof).

c. It is a basic fact that upon completion of construction of each facility an immediate facilities maintenance and operation requirement is created. This requirement establishes a need for trained personnel, equipment, and material. When many and varied facilities are accrued at numerous locations (as occurred in the case of Vietnam), the maintenance and

¹ JCS Pub 3, Joint Logistics and Personnel Policy and Guidance (U), April 1969 (CONFIDENTIAL).

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operation requirements and problems are increased accordingly. The relatively low degree of importance placed on facilities maintenance has been reflected in planning for military operations.

d. The provisions of JCS Pub 3 regarding facilities maintenance are properly general in nature. Applicable Commander in Chief, Pacific (CINCPAC), operations plans referred to the appropriate CINCPAC instruction addressing facilities maintenance planning. This instruction also provided only general guidance and left any further details to the discretion of the Services.

e. The Services contingency plans in support of the CINCPAC operations plans were similarly devoid of detailed provisions for facilities maintenance requirements. The most explicit provisions for facilities maintenance were contained in the Pacific Air Force (PACAF) operations plan, which stated that maintenance and repair of base facilities in support of the plan would be on an austere basis, and only that work necessary to maintain facilities in a minimum acceptable operable condition consistent with the Air Force's anticipated period of occupancy would be permitted. It further provided that conversions and alterations would be limited to the absolute minimum consistent with acceptable operating conditions.

f. Those plans pertinent to Vietnam did not address the requirements for facilities maintenance resources. The troop units to support these plans possessed some degree of organic capability for performing facilities maintenance functions but not to the degree that would prove to be necessary in a prolonged counterinsurgency operation.

g. The omission of provisions for facilities maintenance in the contingency plans is not surprising. Although these plans were adequate for the type of contingency envisioned, they were inapplicable to the graduated-response situation that occurred. Base development plans, a prerequisite to adequate facilities maintenance planning, were practically nonexistent. Even though adequate base development plans would have greatly enhanced the ability to plan for facilities maintenance in Vietnam, other factors also precluded effective planning. Owing to the lack of accurate information regarding the ultimate size of the force to be deployed, tenure of that force, and scope of the construction program, facilities maintenance requirements could not have been ascertained. If these factors had been known, the Services were ill-prepared to act because of in-country personnel ceiling limitations, lack of trained facilities maintenance personnel in the active duty forces, shortages of materials and equipment, and the decision not to effect a general mobilization.

h. The readiness of the Services to respond to greater facilities maintenance requirements was extremely limited. At the close of 1964 the Services had no units specifically organized and tasked to assume facilities maintenance functions in support of contingency operations. The Army's cellular teams and the Navy's Construction Battalion Maintenance Units existed primarily on paper, whereas the Air Force's Prime BEEF (Base Engineer Emergency Forces) teams were in the embryonic stage. The Marines, being primarily an expeditionary force, had no facilities maintenance units in being.

i. The posture of facilities maintenance activities located in Vietnam in late 1964 is described in the following paragraphs.

(1) The Army had some 700 personnel under the Pacific Architects and Engineers (PA&E) contract who were primarily providing support for six MACV advisors' sites. The PA&E forces consisted of U.S. and third-country civilians supervising a Vietnamese labor force. The military involvement was limited to administration of the contract.²

²Thomas Spicknell, Pacific Architects and Engineers, Briefing to Joint Logistics Review Board, A Contractor's Review of Military Logistics Support in Vietnam During the Vietnam Era (1 August 1965 to Present).

7 August 1969

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(2) The Navy, with approximately 1,000 personnel in the Public Works Department, Headquarters, Support Activity, Saigon, was the largest facilities maintenance activity in-country. The force consisted primarily of Vietnamese laborers with Navy Seabees, U.S. civilians, and third-country nationals (TCNs) providing supervision. Although the bulk of this force was located in the Saigon and Cholon area, public works responsibilities extended throughout Vietnam in fulfillment of the expanded role of administrative agent for the MAAG. These were fulfilled by utilization of detachments, contracts, and contact (or traveling) teams.³

(3) The Air Force had 276 personnel who were engaged in base civil engineering operations at air bases in Vietnam. Because of security requirements the Air Force was unable to utilize many local nationals (LNs) in facilities maintenance functions and was primarily dependent on military personnel.⁴

(4) The Marine Corps utilized approximately 50 Marines in providing facilities maintenance support for their helicopter squadron in I CTZ.⁵

j. As the entire logistics system in Vietnam was being conducted on an austere basis, the facilities maintenance operation was basically one of reacting to existing requirements. The effectiveness of facilities maintenance at the close of 1964 was summarized as: "Other logistics functions such as repair and utility (facilities maintenance) type activities were completed at various levels of efficiency according to the initiative and skills of each advisory unit."⁶

k. A shortage of equipment and materials to perform facilities maintenance functions further limited the readiness of the Services to respond to increased requirements.

(1) Illustrative of the situation is the description of a particular Air Force generator problem by the Director of Civil Engineering, 2d Air Division: "A specific example is the 200KW Cummins Diesel generator at Tan Son Nhut. The unit was received in a damaged condition in March 1964. The replacement parts have been on order and re-order and at the end of 1964 were still not on hand. The loss of this generator reduces the capability of the main plant by 20 percent daily whereas the power demand is increasing daily"

(2) In addressing the 1963-1964 time period, a PA&E representative stated: "By nature of our contract we used primarily construction materials. The availability of materials at the job site from the days of the first contract until the present time has been something less than adequate."⁷

3. RECENT DEVELOPMENT IN PLANNING

a. The omission of facilities maintenance considerations in contingency planning was addressed by the Joint Chiefs of Staff appointed Special Military Construction Study Group.⁸

b. Subsequent Joint Chiefs of Staff guidance on the subject of base development planning does not, however, include sufficient provisions for facilities maintenance troops or planning.⁹ In a tab (Construction Force Analysis) to this instruction, only requirements for Air Force

³ Headquarters, Support Activity, Saigon, History, Public Works Department, Headquarters Support Activity, Saigon, 29 November 1965.

⁴ Directorate of Civil Engineering, Pacific Air Forces, Historical Brochure of SEA Engineering Development (1961-1965).

⁵ U. S. Marine Corps Command Center, Chronology of III MAF Buildup in RVN(U), 31 October 1968 (CONFIDENTIAL).

⁶ COMUSMACV, Command History, United States Military Assistance Command, Vietnam, 1964 (U), 15 October 1965, p. 135 (TOP SECRET).

⁷ Pacific Architects and Engineers, op. cit.

⁸ JCS, Report by the Special Military Construction Group (U), 19 July 1968, p. 44 (CONFIDENTIAL).

⁹ JCS, Memorandum SM-643-69, Instruction for Base Development Planning in Support of Joint Contingency Operations, 1 October 1969.

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Civil Engineering units for base maintenance support is recognized. It is particularly worthy of note that the total program requirements or those of any of the other Services for facilities maintenance resources are not addressed in this instruction

4. CONCLUSIONS AND RECOMMENDATIONS

a. Conclusions

(1) The facilities maintenance requirements that evolved in the case of Vietnam far exceeded those of any previous combat theater (paragraph 1a).

(2) The resources necessary to fulfill facilities maintenance requirements in the Republic of Vietnam were not addressed in applicable contingency plans or during the Commander in Chief, Pacific, logistic conference of April 1965 (paragraphs 2a, 2e, and 2f).

(3) The Services' civilian-oriented facilities maintenance systems that had evolved by 1965 adversely affected the readiness of the Services to provide military personnel to perform facilities maintenance tasks in the Republic of Vietnam (paragraph 1b).

(4) The organizations utilized to perform facilities maintenance functions prior to 1 January 1965 in Vietnam did not provide an adequate base on which to expand during the build-up (paragraphs 2i, 2j, and 2k).

(5) The 1 October 1969 Joint Chiefs of Staff Memorandum¹⁰ does not adequately address planning for facilities maintenance requirements in contingency operations (paragraph 3b).

b. Recommendation. The Board recommends that:

(1) Facilities maintenance requirements and adequate resources to fulfill such requirements be identified in the base development plans of logistic annexes to contingency plans. This could be accomplished by modifying the Joint Chiefs of Staff Memorandum, SM-643-6911 to ensure that the following are considered:

(a) Assignment of responsibility for facilities maintenance.

(b) Facilities maintenance resources required to implement the planned facilities maintenance program. These resources include the facilities, maintenance forces (troops, contractors, and local and third-country nationals) and material and equipment to accomplish the facilities maintenance requirements.

(c) Plans for concurrently increasing facilities maintenance forces commensurate with the increase of facilities acquired during the escalation of a contingency operation (BM-1) (Conclusions (4) and (5)).

¹⁰ Ibid
¹¹ Ibid

CHAPTER IV

ORGANIZATION AND BUILDUP OF CAPABILITIES

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ORGANIZATION AND BUILDUP OF CAPABILITIES

1. AREA OF INVESTIGATION

a. This chapter discusses those factors that had a bearing on the Services' capabilities to respond to the growing facilities maintenance requirements during the Republic of Vietnam (RVN) buildup, the organizations as they existed and evolved, and the mobilization of resources to satisfy facilities maintenance requirements.

b. Particularly worthy of note is the distinctly different method that each Service employed to fulfill its facilities maintenance requirements.

2. BACKGROUND

a. Vietnam Situation. The situation relative to facilities maintenance in Vietnam is not comparable with that of any other war. For the first time extensive facilities maintenance services were provided in an active theater of operations. The provision of these services freed tactical troops from many of the problems encountered in the maintenance and upkeep of facilities. Engineer troops were freed to perform operational support and base construction.

(1) Prior to the commencement of the major troop buildup in Vietnam, some of the existing problems regarding facilities maintenance organization and resources had been recognized. In February 1965 it was recommended that all facilities maintenance responsibility be consolidated under the Deputy Officer in Charge of Construction (DOICC), Saigon, to maximize civilian contractor use with better supervision. It was further recommended that common facilities maintenance standards be established for all U.S. personnel. Noted also were the urgent requirements for generators and the repair of generators.¹ As an alternative to the assignment of responsibilities, it was recommended by the OICC, SE Asia, that this responsibility be placed under the Public Works Department, Headquarters, Support Activity, Saigon (HSAS), because utilization of the contractor for facilities maintenance was incompatible with his primary mission.²

(2) The effort to minimize the number of U.S. military personnel in Vietnam had a definite influence on the organization and composition of the facilities maintenance forces that were subsequently to evolve. The desire to civilianize support elements is evident in the following statements.

(a) In January 1965 it was stated that it was necessary to develop an action plan designed to bring about the swiftest possible improvement in U.S. logistics posture without unnecessarily increasing the number of U.S. military personnel detailed to Vietnam.³

(b) In February 1965 at CINCPACFLT Headquarters an Assistant Secretary of Defense (Installations and Logistics) (ASD (I&L)) representative again placed emphasis on the use of contractors in support and maintenance roles.⁴

¹Director for Logistics, The Joint Chiefs of Staff Memorandum, subject: Report of Trip to South Vietnam (U), 5 February 1963 (SECRET).

²OICC, SE Asia, Bangkok, Message 230915Z February 1965 (SECRET).

³Office of the Secretary of Defense, Message 282057Z January 1965 (SECRET).

⁴CINCPACFLT, Message 061832Z February 1965 (SECRET).

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(c) Although the foregoing examples occurred prior to the major buildup of U.S. forces in Vietnam, further evidence indicates that civilianization of support forces was a matter of continuing interest. In an unclassified memorandum for the President, the Deputy Secretary of Defense stated: "During your discussion with General Westmoreland and me last week, you asked about our civilian construction capability in Vietnam and whether it would be possible to make further use of civilians and less use of military construction personnel."⁵

(3) The emphasis being placed on facilities maintenance and the necessity for civilianization was reflected in CINCPAC's reply to the Joint Chiefs of Staff proposals for improvement of logistic support. The Commander in Chief, Pacific, concurred with the concept of a single agency to supervise all facilities maintenance activities and further envisioned that all facilities maintenance would be performed by civilian contract insofar as possible. Supervision of the contract and general supervision were to be the responsibility of the proposed Army logistical command. They further stated, "that the Department of the Army should provide a small engineer detachment within the logistical command with skills in administration, supply, and inspection of utilities, related facilities and material." It was recognized that "should the going get really rough" it would become necessary to replace the civilian facilities maintenance teams, at least in part, by military personnel.⁶

(4) The consideration and attention given facilities maintenance in late 1965 and early 1966 were of brief duration. With the commencement of the big buildup in Vietnam, facilities maintenance reverted to a low priority status.

(a) During a planning conference at CINCPAC Headquarters in April 1965 at which the RVN logistic buildup (including a substantial construction program) was discussed, facilities maintenance requirements or resources were not addressed.⁷ However, the omission of facilities maintenance matters from this conference cannot be considered unusual when one considers the more urgent matters under consideration, the contemplated duration of the conflict, and the meager construction and maintenance resources available. Although a rather extensive construction program was discussed during this meeting the ultimate size and scope could not have been foreseen.

b. Summary. At the beginning of the troop buildup in March 1965, there existed in South Vietnam a minimal capability to perform facilities maintenance. Even though the shortcomings in this area had become a matter of the Office of the Secretary of Defense and Joint Chiefs of Staff interest, the ensuing events in Vietnam precluded a timely solution. A shortage of active duty facilities maintenance personnel combined with the policy of minimizing U.S. armed forces personnel in-country required a different solution to the problem. The advent of the big buildup would only compound the existing problems while providing little relief.

3. RECOGNITION OF REQUIREMENTS. As the buildup continued through 1965 and the tempo of the conflict increased, the expectation of an early victory diminished. The construction program had grown with no proportionate increase in facilities maintenance capabilities or resources. The situation was summarized as follows:

"The objective of the construction program in its initial stages was to provide a maximum of facilities in a minimum of time, without which the military forces could not operate or be supported. In this context the normal process involving consecutive steps, each founded soundly on the preceding one, could not be used."⁸

The unanticipated requirements for facilities maintenance were growing while the bulk of the resources were utilized in the construction effort.

⁵Deputy Secretary of Defense Memorandum, subject: Construction in Vietnam, 8 September 1965.

⁶CINCPAC, Message 260233Z February 1965 (SECRET).

⁷Capt. W. S. Spangler, Civil Engineer Corps, USN, and Col. L. A. Kirstein, USMC, Interviews held at Washington, D. C., 28 August 1969 and 8 September 1969, respectively.

⁸CINCPAC, Message 062337Z January 1967.

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a. Self-Help. As facilities were constructed and occupied by military units, a requirement to perform certain maintenance functions evolved. In the absence of adequate facilities maintenance forces, the requirement fell to the unit utilizing the facility. The programs of self-help maintenance that emerged ranged from those that totally ignored the requirements to ones that were well planned and executed. The degree of self-help performed depended on the type of unit, location, personnel, commander, and existing situation. Self-help was utilized extensively by Army and Marine ground combat elements.

(1) In some instances the self-help program was quite extensive. A maintenance section would be formed from the existing strength of the unit. An aggressive, knowledgeable young NCO or officer would be placed in charge to organize and prosecute a maintenance and utilities program. This program sometimes included power distribution systems, water distribution, minor construction, and other functions not normally associated with the unit's usual operations. Equipment and materials for this effort were normally obtained from any and all sources, i.e., engineer units, civilian contractors, supply depots, and the open market.

(2) It must be noted that self-help maintenance, though advantageous to a degree, has certain drawbacks. The personnel drain often degraded a unit's capability to perform its primary missions; the procurement of materials and equipment was time consuming, expensive, and often illegal; and the performance of unskilled personnel frequently resulted in faulty and hazardous work.

(3) In spite of the fact that self-help was a necessity, particularly in the initial stages of the buildup, it cannot be favorably compared to the performance of adequately trained, organized, and equipped facilities maintenance forces for the major maintenance effort.

b. MACV-DC. Although one of the functions of the Director of Construction, Military Assistance Command, Vietnam (MACV-DC), was to "exercise supervision of interservice facilities maintenance matters,"⁹ evidence indicates that this office was not intimately involved in the facilities maintenance functions. A subsequent directive established very general guidelines.¹⁰

c. Requirements. It is not possible to determine the exact point in time when the facilities maintenance capabilities, including self-help, so far lagged behind the requirements that facilities maintenance surfaced as a major problem. A review of the records, however, indicates that in June of 1966 each of the Services had begun to develop a capability to meet existing and projected requirements. Statements made by individual Service representatives on 28 June 1966 before the Real Property Maintenance Council, OASD (I&L), are indicative of the situation at that time.

(1) The Army representative stated:

"... at the time of our visit (May 1966) the contractor's (PA&E) effort on post engineering was limited. However, action was initiated by the command to step up this effort to assure that construction as it is completed by the OICC or troops is subject to maintenance and repair control to prevent its deterioration. As this is achieved it will progressively relieve the troops of responsibility for post engineering (facilities maintenance) work in their areas."

(2) The Navy situation was similar and led to the following statements:

"Tempo of operations with rapid buildup of forces has precluded many normal maintenance management procedures. Breakdown maintenance is not uncommon. Often the work to be accomplished is based on combat requirements with no relationship to normal considerations. The expertise to establish sound technical

⁹ MACV Directive 415-2, 15 February 1966.
¹⁰ MACV Directive 415-8, 26 January 1968.

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maintenance organization, programs and policies has been carried to the combat theater by experienced U.S. Navy Civil Engineer Corps (CEC) Officers.

"The goal is to provide the necessary men and materials for maintenance and repair of facilities at adequate levels to assure continuity of operations and to preclude uneconomical cost due to excessive deterioration."

(3) The Air Force comment was even more explicit. Their representative stated:

". . . in effect, we are building, operating from, and maintaining our facilities simultaneously. Maintenance to date has been largely operator maintenance. When a breakdown occurs repairs are made utilizing parts or spares available. When necessary, replacement equipment is used to provide the services needed. Our current policy then is to place responsibility with 'the man on the spot' and to waive the details of a normal maintenance program."

d. Response. As the buildup continued each of the Services responded differently to the requirement for facilities maintenance support. The Army provided support by contract, whereas the Air Force utilized temporary duty (IDY) teams from within PACAF until permanent base civil engineer (BCE) organizations could be established. By August 1965 the Air Force was deploying Prime BEEF teams to RVN to augment BCE squadrons and to provide specific military skills in support of short-term combat operations. (Prime BEEF teams are specially tailored teams of civil engineering military personnel designed for unforeseen contingencies and special air warfare operations.) The Navy provided common support through HSAS until the Army developed a support capability within the newly established 1st Logistical Command. The transfer of support responsibility occurred on 1 April 1966. On 17 May 1966 HSAS was deactivated. On the same date the Naval Support Activity (NSA), Saigon, was established as a Commander, Service Force, Pacific Fleet (COMSERVPAC), activity under the operational control of Commander, Naval Forces, Vietnam (COMNAVFORV), to continue service-peculiar support to naval units within II, III, and IV Corps Tactical Zones (CTZ). In I CTZ designated common support responsibilities were carried out by the NSA, Da Nang. These would later be extended to the provision of facilities maintenance support in the main enclaves by utilizing a military personnel force augmented with third-country nationals (TCNs) and local nationals (LNs).

4. DEPLOYMENT AND ORGANIZATION OF CAPABILITIES

a. U. S. Army

(1) The 1965 buildup of combat forces in Vietnam found the Army's in-country facilities maintenance capability vested in the resources of its contractor, Pacific Architects and Engineers (PA&E), this contract having been awarded in 1963, as discussed in Chapter II of this monograph. The buildup of combat forces and related increase of facilities from 1965 to 1966 found the Army responding with an expansion of the PA&E contract throughout their area of responsibility in II, III, and IV CTZ. The existence of the contract combined with the Department of Defense (DOD) objective of minimizing the number of in-country support troops, the absence of a general mobilization of reserves, and the lack of sufficient manpower space authorizations (military or direct-hire civilians) to accomplish the facilities maintenance requirements caused the Army to rely, almost entirely, on PA&E for facilities maintenance support. The piecemeal buildup made it almost impossible to predict requirements or even the eventual location of incoming troop units. The concept of supporting installations was one of tailoring the contractor organization to that particular installation.¹¹ The personnel required for this effort would be augmented or replaced as the situation and availability of personnel permitted.

(2) The work force provided under PA&E contract consisted of U.S. civilians, TCNs, and LNs. (The growth of these forces is illustrated in Figure 1.) The LNs provided the bulk of the common labor force, and the TCNs (mostly Korean) were utilized in the skilled

¹¹OASD (J&L), Real Property Maintenance Council Meeting, 28 June 1966.

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positions with U.S. civilians performing supervisory functions. The work force mix was approximately 5 percent U.S., 15 percent TCNs, and 80 percent LNs. The breakdown in FY 68, for example, was 1,500 U.S. citizens, 3,500 TCNs, and 16,000 LNs. This 21,000-man work force was distributed at some 80 sites in 1968, ranging in size from small MACV advisor sites to division- and larger-sized base camps. The total cost of the contract had risen to nearly \$100 million with the contractor furnishing the required labor, organization, and management. The Government provided equipment, repair parts, tools, and materials on a nonreimbursable basis as well as quarters and messing facilities on an as available basis.

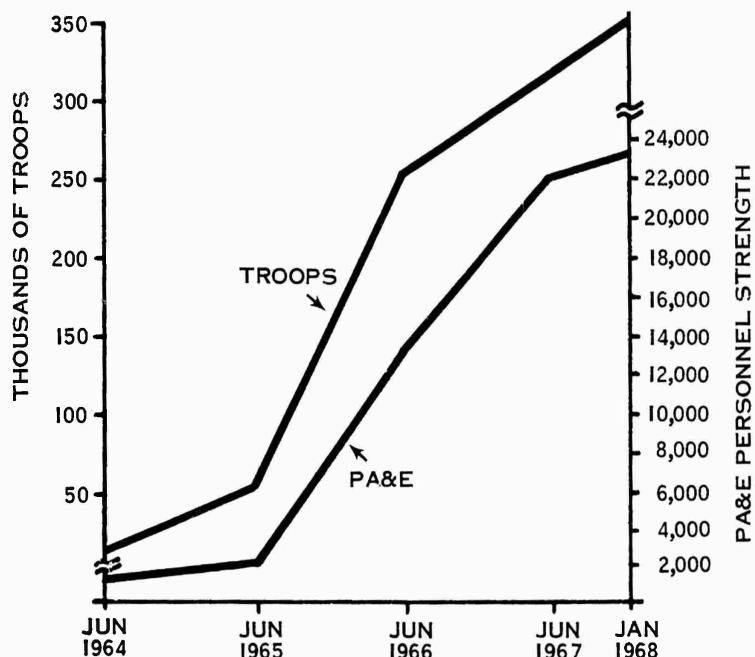


FIGURE 1. COMPARISON OF TROOP STRENGTH TO ARMY FACILITIES MAINTENANCE PERSONNEL (DOES NOT INCLUDE CELLULAR TEAMS)

Source: PA&E, Briefing to JLRB, 7 August 1969.

(3) Figure 2 depicts the Army's organization for facilities maintenance that had evolved by July 1968. Administrative control of the PA&E contract was exercised by the U.S. Army Procurement Agency, Vietnam (USAPAV), a subordinate command of the 1st Logistical Command. The USAPAV reported through procurement channels to U.S. Army, Japan (USARJ). The contracting officer and the property administrator were members of USAPAV. Prior to 1 July 1968 this command was responsible for facilities maintenance under the staff supervision of the U.S. Army, Vietnam (USARV), Engineer. Technical control was exercised through a Contract Operations Division of the Office of the Director of Engineering, Headquarters, 1st Logistical Command, co-located with the Contract Management Office (CMO); through the engineers on the staffs of the three 1st Logistical Command Support Commands; and through the contracting officer's representatives (CORs) — usually field grade Corps of Engineers (CE) officers — located at major installations. The quality and degree of control varied with the number and capabilities of the CORs. On 1 July 1968 the responsibility for technical control passed to the Commanding General (CG), U.S. Army Engineer Construction Agency, Vietnam (USAECAV). Although the organizational lines remained similar to previous ones, the CORs' positions were filled by engineers who were responsible for direction and supervision of the contractor's efforts. The three District Engineers (located at Saigon, Qui Nhon, and Cam Ranh Bay) supervised the Installation Engineers located at the various bases. Although not members of the installation staff, they provided technical support to the installation in which they were located.

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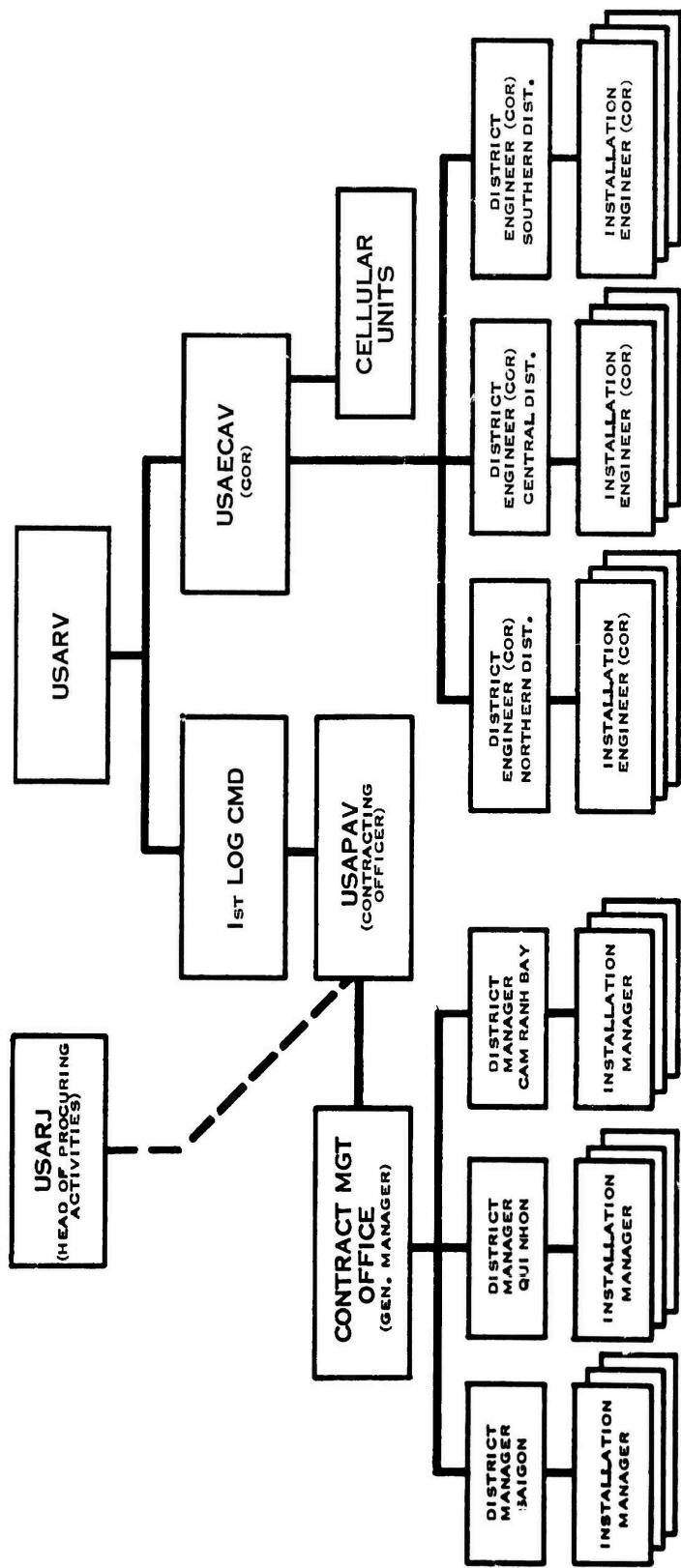


FIGURE 2. U.S. ARMY ORGANIZATION FOR FACILITIES MAINTENANCE, RVN

Sources: PA&E, Briefing, Aug. 1969.
USAPAV, Procurement Support in Vietnam, 1966-1968.

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and were directly responsible to the District Engineer in their area. The USAECAV's intention to assume an active role in the management of the facilities maintenance efforts (the contract) was evidenced by the fact that the number of Army personnel directly associated with supervision of the contractor's efforts was nearly tripled (73 under 1st Logistical Command as compared to USAECAV's 212).

(4) Shortages of materials supplied by the Government occurred frequently throughout the life of the contract. This was particularly true as far as lumber and electrical and plumbing materials were concerned. Needed equipment, e.g., graders, tractors, fork lifts, and water tank trucks, was not provided by the Government to the contractor in the required quantities or in a timely manner. Reasons included lack of equipment allowance authority required by Army regulations, delays in approval of tables of distribution and allowances, and the inability of industry to furnish some items. Shortages of repair parts further compounded the equipment problems. The relatively low priority given to transportation of facilities maintenance materials and equipment often caused them to be delayed in the movement system while serious out-of-stock conditions existed in some locations.¹²

(5) Additional facilities maintenance support was provided by the Army's cellular teams under the Table of Organization and Equipment (TOE) 5-500. Approximately 1,450 men were deployed to RVN as utilities detachments, fire fighting teams, water purification teams, and power plant operation and water supply companies ranging in size from four to 40 personnel. Although some of these units operated at the same camps as did the contractor forces, they were primarily intended for employment in outlying areas where security considerations precluded contractor utilization. Under the control of the 1st Logistical Command, and later USAECAV, these utility detachments were utilized on minor construction as well as in their assigned maintenance roles.

(6) Other real property maintenance support was furnished by the Vinnell Corporation, which operated and maintained high-voltage central power plants at several major installations, and by a force account operation controlled by the Headquarters, Area Command (HAC), in the city of Saigon. This latter operation was supported by a PA&E contract force, since HAC was unable to recruit sufficient qualified personnel to eliminate all contractual real property maintenance efforts in the HAC area.

b. U. S. Navy

(1) A facilities maintenance organization and capability, in excess of those inherent to the committed naval forces, did not exist in the I CTZ during the 1965 buildup of forces, nor was such a capability or organization contemplated. Facilities maintenance, when accomplished, was done on a self-help basis with engineer-oriented units often providing the technical knowledge as well as some equipment and materials. Marine Corps units in I CTZ possessed a limited capability for facilities maintenance, but owing to their expeditionary nature they were to require external support in an extended land campaign. The more-immediate problems existing in mid-1965 relegated facilities maintenance to an insignificant position. The determination of who would provide logistic support in I CTZ had not been resolved and the decision as to what such support would be was even more remote. The requirement for NSA, Da Nang, was recognized and authorization for its establishment was requested.¹³ The Chief of Naval Operations (CNO) pointed out, however, that the NSA could not be formed without the mobilization of certain reservists. He further stated that he was requesting additional personnel from the Secretary of Defense.¹⁴ The Commanding General, Fleet Marine Forces, Pacific (CGFMFPAC), subsequently sent a message to CINCPACFLT summarizing those areas in which it was clear at the outset

¹²Pacific Architects and Engineers, Briefing to Joint Logistics Review Board, subject: A Contractor's Review of Military Logistics Support in Vietnam During the Vietnam Era, (1 August 1965 to Present), 7 August 1969.

¹³COMSERVPAC, Message 250246Z May 1965 (SECRET).

¹⁴CNO, Message 282110Z May 1965 (SECRET).

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that FMFPAC could not fully meet the onshore requirements of the Naval Component Command (NCC) from organic resources. He further noted that, as the operation progressed, additional deficiencies could appear that would require CINCPACFLT assistance to provide the requisite capability. Included among these was facilities maintenance.¹⁵ The subsequently established (October 1965) NSA, Da Nang, did not include facilities maintenance forces other than those to perform maintenance required within NSA itself. Much of the early public works effort was directed toward leasing living and working facilities for the NSA in the city of Da Nang. Initially, practically all the facilities maintenance performed by the Public Works Department was internal to the NSA itself and was theoretically limited to secure areas, but as the troop buildup continued the need for an expanded facilities maintenance concept was recognized.

(2) It became apparent in the latter part of 1966 that the Navy and Marine Corps would remain in the I CTZ area for an indefinite period. Upon completion of numerous facilities for both Services, it became necessary to establish arrangements to operate and maintain them properly. In addition to the existing and pending power plants, utility systems, air fields, roads, waterfront structures, refrigerated storage, and transportation equipment, provisions were also required to maintain cantonment areas. These types of services required specially trained personnel not normally available from the combat-oriented Marine forces. As an interim measure, detachments from Naval Construction Battalions and engineer-oriented Marine units continued to perform limited maintenance assistance.

(3) In response to a request submitted by the Commander of NSA, Da Nang, a team composed of members from the staffs of the COMSERVPAC and Commander, Pacific Division, Naval Facilities Engineering Command (PACDIV NAVFACENGC), arrived at NSA, Da Nang, to determine and report the requirements for expanding the Public Works Department in the secure areas of I CTZ. The result of the team's effort, submitted in October 1966, called for expenditures that totaled over half of the public works funds administered by the PACDIV NAVFACENGC for maintenance and repair of real property (exclusive of minor construction, alterations, and major repairs) and public works operations for all other shore facilities in the Pacific area of responsibility. Public works personnel requirements approximated 4,000 of which less than 50 percent were on board at Public Works, NSA, Da Nang, in October 1966.¹⁶

(4) In consideration of the magnitude of the tasks and the limited assets available to NSA, Da Nang, COMSERVPAC recommended certain limitations to the public works support to be made available. Upon approval by the CNO in January 1967, NSA, Da Nang, was tasked to assume support of Marine units within the advance base complexes of I CTZ. The support was to include the following:

- (a) Maintenance, repair, and minor construction of all permanent and semi-permanent facilities.
- (b) Provision, operation, and maintenance of transportation and construction equipment as required.
- (c) Maintenance and operation of utility systems
- (d) Real estate acquisition.

(5) In March 1967, facilities maintenance assistance was officially commenced for the 1st Marine Air Wing in the Da Nang area. In the late fall of 1967, detachments were set up to support the Force Logistics Command and the 1st Marine Division. Support for the 1st Marine Air Wing elements at Chu Lai also began to build up during this period and a small public works detachment was formally established at Phu Bai during the summer of 1967 to assist the 3d Marine Division Headquarters.

¹⁵CGFMFPAC, Message 080951Z June 1965 (SECRET).

¹⁶PACDIV NAVFACENGC, Study to Determine Requirements for Expanding the NAVSUPPACT Public Works Department, 25 October 1966.

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(6) Facilities maintenance support for the Marine Corps in I CTZ developed along the following lines. Assistance would initially be given to Marine units in repairing and operating field generators. The next stage was for facilities maintenance forces to take over the major responsibility for the whole electrical system. Water supply was next, followed by facilities maintenance forces answering trouble calls in all areas. Simultaneously, design, contract, and real estate services received increasing calls as the I CTZ complex grew. Although the Marines had small organic maintenance and utility units or could call on Marine combat engineers on occasion, their requirement for a facilities maintenance organization in the form provided by the Navy became more apparent as forces and facilities grew. Requirements for the maintenance of airstrips at Dong Ha, Khe Sanh, and An Hoa resulted in the deployment of the Construction Battalion Maintenance Unit (CBMU) 301 in-country during May 1967. The 12 officers and more than 500 men of CBMU-301 acted as an extension of "Public Works North" at Dong Ha. The CBMU was assigned to operational control of Commander, NSA, Da Nang, and the Commanding Officer of the CBMU received his instructions from the Public Works Officer, NSA, Da Nang. Initially, these were to maintain the airstrips at the three mentioned sites and to render other facilities maintenance support within the capabilities of the units. Personnel were shifted as circumstances dictated.

(7) The scope of the responsibilities expanded as the conflict progressed. By message in June 1967¹⁷ CINCPAC reiterated that the basic responsibility for administrative and logistic support of Military Assistance Advisory Groups and other military assistance activities within I CTZ was assigned to COMNAVFORV.

(8) In August 1967, public works support of the MACV advisors was started. This not only called for roving teams of automotive and power generator mechanics, but also brought permanently assigned Seabees from the Public Works Department, NSA, Da Nang, to all of the major advisor compounds in I CTZ — Quang Tri, Hue, Hoi An, Tam Ky, and Quang Ngai. The main advisor headquarters in Da Nang was, of course, serviced by the main public works shops there.

(9) In October 1967, Commander, NSA, Da Nang, was given tasking and authorization to extend support formerly given to the Marines to those forces that had replaced them. As in the case of the Marines, public works support was stated as limited to within the perimeters of those advanced base complexes that embodied an established or programmed Public Works Department. Emphasis was placed on self-help.¹⁸

(10) The Tet Offensive of 1968 resulted in a dramatic influx of Army units into I CTZ. Army strength increased from 9,180 in January 1967 to 25,800 in January 1968 and, subsequently, to a peak of 83,000 in October 1968. An Interservice Support Agreement (ISSA) was drafted and signed by COMNAVFORV and USARV on 1 March 1968 and was fully implemented by 1 August 1968. The growing number of troops to be supported was not accompanied by a corresponding increase in the facilities maintenance force of NSA, Da Nang. The Army utilized PA&E forces to perform facilities maintenance in those areas not serviced by the Public Works Department or its detachments.

(11) The requirements for additional facilities maintenance in view of increasing requirements were constantly monitored by the Navy. A study conducted by COMSERVPAC and PACDIV 7 FACENGCOM representatives in August 1967 had recommended a Public Works Department of 4,373 people. In view of the pending requirements to support all Army units located in nontactical areas in I CTZ, another study was conducted in December 1967. This study recommended an increase to approximately 5,500. The constantly changing tactical situation resulted in a subsequent study in May 1968, which recommended a total Public Works force approximating 7,300 personnel. These studies were instrumental in increasing the authorized allowance of the Public Works Department, NSA, Da Nang, to 6,928 in late 1968. The facilities maintenance force grew to nearly 6,800 persons on board by 1 January 1969.

¹⁷CINCPAC, Message 060353Z June 1967 (SECRET).

¹⁸COMSERVPAC, Operations of Service Forces, U. S. Pacific Fleet, Fiscal Year 1968 (U), (CONFIDENTIAL).

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(12) Initially, the Public Works Department found that its facilities maintenance forces were being used extensively on minor new construction and alteration and other Public Works functions not related to maintenance. There was a gradual shift to maintenance and repair jobs as the major construction effort progressed.

(13) A great deal of the success of the Public Works Department at NSA, Da Nang, was attributable to its Philco-Ford service contract. This Cost Plus Award Fee (CPAF) level of effort contract provided many of the assets and much of the flexibility necessary to meet the changing requirements in I CTZ. The Navy realized early in 1966 that an all military work force was not feasible in the existing situation. It was apparent that a shortage of both skilled and unskilled labor presented a major problem. Even though Vietnamese nationals could be hired to provide much of the unskilled labor, they did not possess the skills required for the technically oriented positions. Since the skills could not be provided from in-house assets or local hires, it was necessary to augment the work force with TCNs through a service contract. Philco-Ford was awarded a contract in March 1966 and was subsequently instrumental in fulfilling this need.

(14) The requirement for personnel to meet the expanding facilities maintenance responsibilities in I CTZ was fulfilled by Public Works, NSA, Da Nang, by utilizing a force of approximately one-third Seabees, one-third direct-hire (LNs), and one-third contract (TCNs). It was anticipated that this mix would provide the required continuity of management supervision (under Public Works, NSA, Da Nang) and labor forces to meet facilities maintenance requirements under combat circumstances. It would further provide the basis on which to prepare for changing responsibilities (see Chapter II) in I CTZ. The buildup of the Navy's facilities maintenance personnel in I CTZ is depicted in Figure 3.

(15) The Public Works Department, NSA, Da Nang, has remained a viable organization since its beginning in 1965 because of its ability to adjust to almost constantly changing requirements. This is due in part to its flexible organization based along the normal lines of Naval Public Works Centers found throughout the Naval Establishment. The Navy's organization to perform facilities maintenance throughout Vietnam is shown in Figure 4.

(16) The long lead times to procure materials, equipment, and repair parts for equipment was the major problem experienced by Public Works, NSA, Da Nang. The proliferation of makes and models of standard and nonstandard equipment, especially generators, created numerous problems. Further compounding the problem of shortages of materials, equipment, and repair parts was the delayed movement caused by the limited availability of surface transportation with which to distribute those assets to responsible detachments throughout I CTZ.

(17) On 1 January 1965 the Navy's logistic support capability in RVN was vested in HSAS. This organization was established originally to perform logistics functions assigned to the Navy by DOD Directive 5100.3. The Public Works force had grown from its original 593 in July 1962 to 2,200 employees in December 1965. With the establishment of the Army's 1st Logistical Command, the turnover of responsibilities for facilities maintenance was accomplished in April 1966. The HSAS was disestablished, and NSA, Saigon, was commissioned in May of that same year. This new organization was specifically tailored to support the increasing Navy activities in II, III, and IV CTZ. The Public Works Department was responsible for limited construction and maintenance of facilities at the Market Time and Game Warden bases as well as the maintenance of NSA's installations in Saigon. Public works support of these outlying facilities required augmentation of NSA, Saigon, by 100 Seabees from Da Nang, due to the inability of the Army's contractor (PA&E) to meet stated requirements. These Seabees remained in the south until their individual tours were completed. A requirement for additional maintenance personnel existed on their departure. This requirement was subsequently satisfied by the arrival of CBMU-302 in September 1967. This newly commissioned unit of 200 (which was to grow to approximately 300) men supplied some two-thirds of the manpower involved in public works functions under the cognizance of NSA, Saigon.¹⁹

¹⁹Capt. C. J. Merdinger, CEC, USN, Report on Public Works Danang, July 1968.

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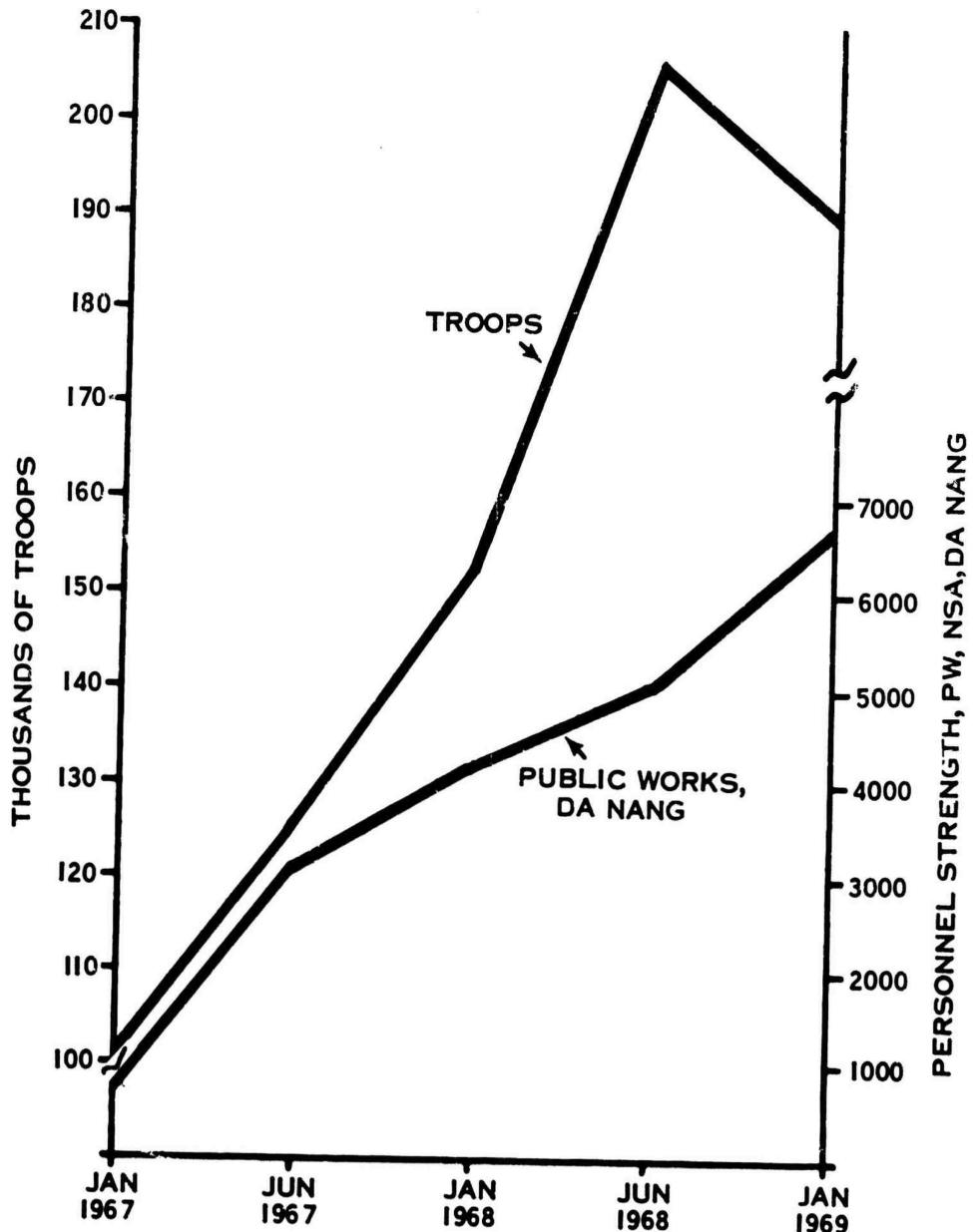


FIGURE 3. COMPARISON OF I CTZ TROOP STRENGTH TO NAVY FACILITIES MAINTENANCE PERSONNEL (INCLUDES SEABEES, DIRECT-HIRE, AND CONTRACT PERSONNEL)

Source: Public Works, NSA, Da Nang, Point Papers, 1 July 1969.

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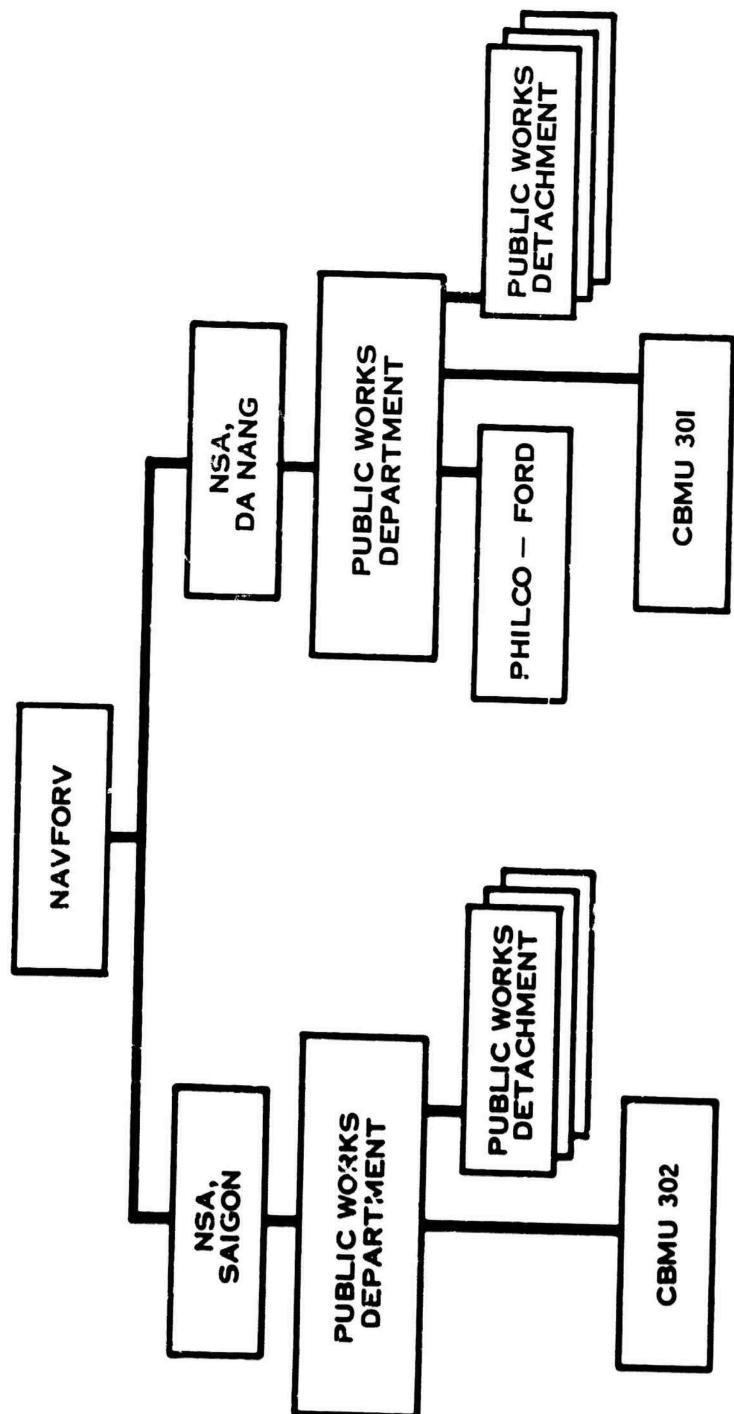


FIGURE 4. U.S. NAVY ORGANIZATION FOR FACILITIES MAINTENANCE, RVN

Source: Capt. C. J. Merdinger, CEC, USN, Civil Engineers Seabees and Bases in Vietnam, 1 May 1969 (Unpublished Report).

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c. U.S. Air Force

(1) The fulfillment of facilities maintenance requirements for the Air Force in Vietnam was accomplished with considerably fewer problems than experienced by the other Services during the same period. There were three primary reasons for this.

(a) The physical characteristics of an air base are relatively uniform and usually not subject to relocation.

(b) Air Force civil engineering personnel (military) were utilized in BCE units on a TDY basis and in the newly formed Prime BEEF teams and RED HORSE Squadrons.

(c) The dependence of the Air Force on a high degree of facilities maintenance to accomplish its mission. In addition to the air bases in Vietnam, it must be noted that a great number of Air Force operations originated in Thailand. The some 500 aircraft deployed at 10 major and 47 minor bases throughout Thailand requiring approximately 35,000 military personnel for their operation were supported by BCEs and a RED HORSE Squadron totaling 6,400 personnel (1,600 USAF and 4,800 civilians). Civilian contractors were utilized to the maximum extent feasible in performing facilities maintenance requirements in Thailand.²⁰

(2) The Air Force utilization of civilian contractors in RVN was primarily for power generation, refuse collection, and other small well-defined tasks. Security restrictions and the necessity of maintaining reliable facilities maintenance assets at operational airfields militated against the use of civilian forces in any predominant role.

(3) The organizational structure utilized in RVN paralleled that used by the Air Force in the continental United States (CONUS). Exceptions were that the industrial engineer function was eliminated, limited real property accounting was utilized, and no cost accounting existed. A simplified system of real property inventory was established as a basis for the preventive and annual maintenance programs required by existing Air Force regulations. The extremely limited facilities resources available made it mandatory that the best possible efficiency be obtained and that priority of effort be controlled and directed. Application of this concept provided continuity in the face of rapid turnover of personnel and was instrumental in ensuring that the maintenance effort was meshed with the construction program. Employment of TDY and Prime BEEF teams in the early stages of the buildup provided a minor construction capability that freed regularly assigned civil engineer forces to perform their required functions. Subsequent organization and utilization of RED HORSE Squadrons, each consisting of 400 civil engineer personnel augmented by 500 to 600 local hires, further allowed BCEs to conduct business as usual and provided a heavy repair and construction capability. The Air Force organization for facilities maintenance in RVN is depicted in Figure 5.

(4) Base supply accounts had been established during the early 1960's to support the advisory effort. These accounts depended on supply support being provided by Clark Air Base in the Philippines. As the rapid expansion occurred in 1965, efforts were made to comply with the supply system specified in existing Air Force regulations. It soon became evident, however, that the unusually long lead time required to obtain items from CONUS and the emphasis being placed on construction materials rather than bench stock supplies imposed a situation not previously visualized. Large bulk purchases of construction materials created a requirement for additional storage space and an increased number of personnel to handle the materials. The supply organizations possessed neither. Consequently, the BCE, of necessity, assumed the responsibility of manning and operating an engineer supply point. This type of operations was not compatible with the computer program; however, by late 1966 inventory was taken of stocks and recorded so that consumption data could be obtained. The supply point job was subsequently turned back to the base supply officer.

²⁰OASD (I&I) Memorandum for Record, Subject: Real Property Maintenance Council Meeting, 26 February 1968.

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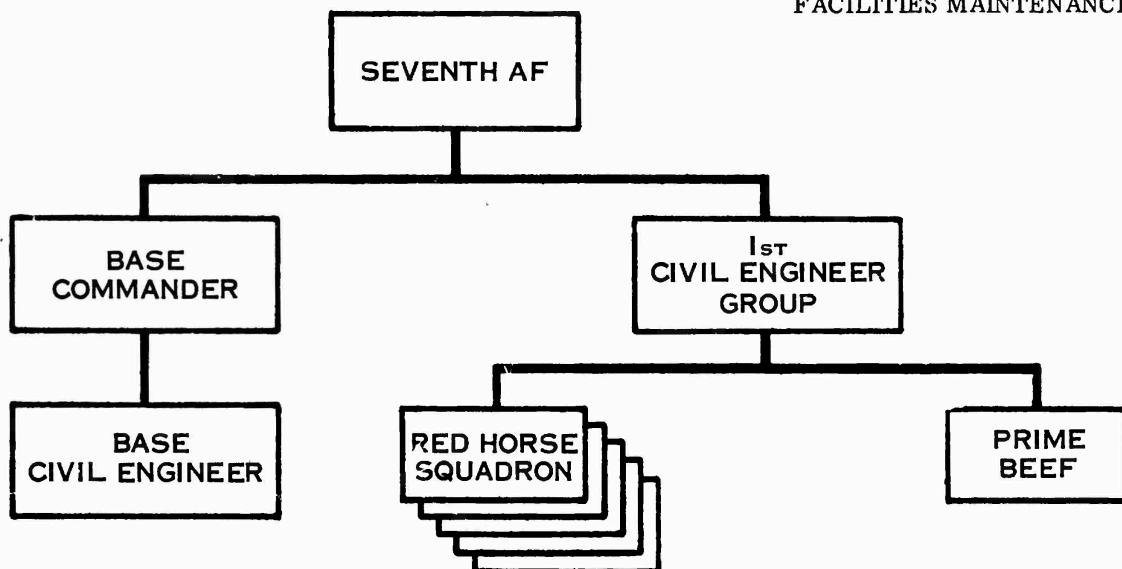


FIGURE 5. U.S. AIR FORCE ORGANIZATION FOR FACILITIES MAINTENANCE, RVN

Source: Department of Air Force, RED HORSE in Southeast Asia, 1965-1967, Corona Harvest RED HORSE Interim Report.

(5) The initial equipage list provided a sufficient quantity of equipment for a normal state side operation. It soon became evident that the equipment, particularly generators, was not designed or built for the rugged use experienced in RVN. Spare parts rapidly became a most difficult problem. As a result of constantly changing channels and excessively long supply lines, it soon developed that spares would only come through as a result of emergency procedures such as Vehicle Deadlined for Parts (VDP) requisitions.

(6) The existing logistics system was described as:

"purely a 'push' system which sent in tons of material, much of which could not be used but had to be handled by an already unmanned supply force. The manning of the supply function was based on CONUS standards where many items of supply are bought on the open market and do not need to be stocked or handled. In addition there are generators, water supply materials, runway matting, revetment material and a multitude of other items not required in CONUS which must be received, stocked, and accounted for here."²¹

(7) Additional problem areas noted by the Air Force civil engineers were the non-availability of engineer equipment and spare parts for engineer equipment and the inability of the distribution system to provide required materials in a timely manner.

(8) Initial authorizations for facilities maintenance personnel in Vietnam were adequate for the existing requirements in early 1965. As the buildup continued, however, it became necessary to augment BCEs with more local hires and, subsequently, TDY and Prime BEEF teams. A military utilization survey team evaluated the BCE requirement in February 1966. By the time new personnel authorizations were approved and on board (early 1967), the situation had changed substantially and required additional personnel. Figure 6 depicts the growth of Air Force maintenance forces. It must be noted that these figures do not include the five RED HORSE Squadrons deployed to Vietnam (each squadron having a complement of 400 civil engineer personnel augmented by 500 to 600 LNs) or the 2,000 personnel deployed as Prime BEEF teams.

²¹ Col. Archie S. Mayes, Directorate of Civil Engineering, Seventh Air Force, End of Tour Report, 11 July 1967.

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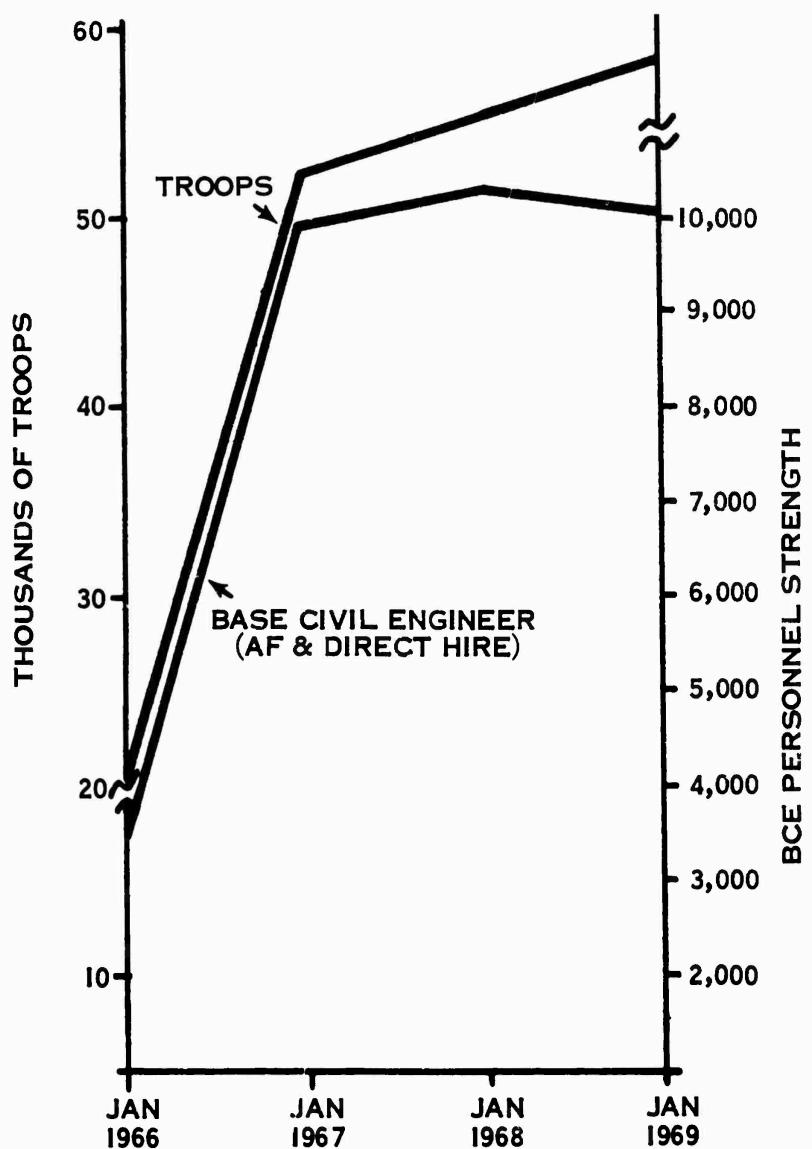


FIGURE 6. COMPARISON OF TROOP STRENGTH TO AIR FORCE FACILITIES MAINTENANCE PERSONNEL (DOES NOT INCLUDE TDY, PRIME BEEF OR RED HORSE)

Source: Force Management Branch, Management Division, Directorate of Civil Engineering, Headquarters, USAF, 9 October 1969.

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5. DISCUSSION

a. General

(1) It is worthwhile to note the contrast of the three basic means utilized to fulfill facilities maintenance responsibilities in Vietnam. The Army, at one extreme, depended almost entirely on their civilian contractor. The Air Force program, at the other extreme, was basically troop oriented. The Navy, in providing support in I CTZ, was somewhat of a combination of the two in that it provided a troop base for management, supervision, and emergencies augmented with a large force of LNs (direct hire) and skilled TCNs (provided by contract). All three methods experienced varying degrees of success and fought to overcome similar problems.

(2) There exist no finite standards of facilities maintenance by which to compare the effectiveness of the various methods. Even the often-utilized cost effectiveness study is meaningless for comparative purposes because of the varied conditions under which facilities maintenance was accomplished and the lack of data identifying expenditure of funds for facilities maintenance functions. The primary source of information for purposes of comparison is therefore limited to the evaluations and opinions of those who were involved.

b. Civilian Contractors

(1) Under the provisions of the Army's PA&E contract, the contractor was responsible for providing the work force, organization, and management to perform facilities maintenance requirements. This, combined with the desire of 1st Logistical Command to adhere to the provisions of the Armed Services Procurement Regulations regarding the prohibition of personal services contracts (discussed in detail in Chapter V), created a somewhat autonomous position for the contractor. The contractor was frequently criticized for inadequate performance and less adequate management.²² The Army ultimately assumed a more active role in the management of the contractor's forces when USAECAV was assigned facilities maintenance responsibilities.

(2) The Navy, in comparison, utilized the contractor primarily to obtain skilled personnel to augment their military (Seabees) and direct-hire (LN) forces. Except for a few industrial facilities (i. e., tire recapping plant, component overhaul shop, oxygen and acetylene plants, and battery shop), the contractor was not utilized for overall management.

(3) The Air Force utilized contracting to a much greater extent than is commonly realized. Their contracts, however, were usually for special tasks, such as power generation and refuse collection, and were smaller though numerous.

(4) It should be noted that the facilities maintenance functions created a great demand for a variety of skills and that the utilization of Vietnamese civilians to perform these maintenance functions upgraded their skills to a level they would otherwise not have attained.

c. Personnel

(1) The problems in obtaining civilian personnel, both direct-hire and those hired by the contractors, were applicable to all Services in Vietnam. The Vietnamese manpower pool (including women) could not provide adequate numbers of personnel with the required skills to meet the needs of construction and facilities maintenance forces. The utilization of TCNs to help fill this void was constantly hampered by Vietnamese Government restrictions and time-consuming clearance processes.

²²U. S. Army Procurement Agency, Vietnam, Procurement Support in Vietnam 1966-1968, undated, p. 32; and U. S. Army Audit Agency Report #69-26, Maintenance and Management of Facilities, RVN, 22 January 1969.

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(2) Personnel ceilings placed on direct-hire Vietnamese is discussed in Chapter V.

(3) Both the Army and the Navy and to a lesser degree the Air Force experienced a shortage of military personnel trained in facilities maintenance skills and proficient in managing the various details of the program. Although service training programs were able to alleviate this shortage of trained personnel in due time, the in-country military ceilings (as set forth by the phases of the DOD-controlled deployment programs) created another problem. It was exceedingly difficult to obtain space allocations for facilities maintenance personnel because of the limitation on the number of military personnel authorized in-country. The length of time from the expression of a requirement (e.g., an additional number of Seabees needed by NSA, Da Nang, to meet increased requirements in 1968) until those required reported on board was a minimum of 7 months. Approximately 4 months of this time was required for submission and approval of the increase or change in the number of personnel for the particular deployment program in effect at the time.

d. Organization. The interesting aspects of the facilities maintenance organization that evolved in Vietnam are (1) each Service relied basically on its standard peacetime organization, and (2) these organizations bore little resemblance to the ones that existed in-country at the commencement of the buildup in 1965.

e. Material and Equipment

(1) The inability of existing systems to supply adequate materials and equipment for facilities maintenance has been another common problem of the Services. This situation is less surprising when one realizes that the materials and equipment required for maintenance are generally the same as those required for construction, that they were inadequate to meet construction requirements, and that construction requirements held priority over facilities maintenance requirements. It must further be realized that much of the materials and equipment were utilized by maintenance forces in minor construction projects.

(2) The shortage of equipment was further compounded by high deadline rates, caused by an acute shortage of repair parts and a proliferation of standard and nonstandard equipment. The Vietnam environment and the necessity to utilize equipment around the clock resulted in rapid utilization of repair parts, a commitment of backup equipment, and a dramatic decrease in the life expectancy of equipment in our inventory.

(3) The generator problem was one that was primarily a facilities maintenance one. The inventory of generators in Vietnam has never been ascertained as to number, type, location, and capacity. It is known, however, that a large number of foreign-made generators were in-country as well as numerous standard and nonstandard U.S. types. It was generally found that regardless of the number and type of generators available at a location they were inadequate to meet requirements. Many of these requirements for power were nonoperational but had evolved from the proliferation of electrical appliances, air conditioners, and other items requiring power that had not previously been considered in the development of construction requirements. This unexpected requirement occurred owing to the high standard of living (what has been referred to as the comfort level) that evolved. Computer centers in the combat zone created another requirement for power that had not been fully anticipated.

f. Troops

(1) It was necessary to utilize an organic troop capability to perform facilities maintenance functions in many areas and on many occasions, e.g., isolated bases, areas not secure, restricted security areas, strikes, and enemy attacks, to provide continuity of required operations that must be accomplished regardless of the existing situation. Such essential operations include power generation for Combat Operation Centers, communications facilities, air control facilities, and medical facilities; refrigerated storage; combat-damage repair; and fire fighting. Troops were also required to administer the facilities maintenance programs and to supervise and manage the contractor personnel.

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(2) The requirements for military facilities maintenance units (the Army's cellular teams, the Navy's CBMUs, and the Air Force's Prime BEEF teams) are self-evident in areas that are not secure. However, experience in Vietnam has indicated a substantial requirement for similarly trained military personnel in the so-called secure areas. On numerous occasions the civilian facilities maintenance personnel, contractor and direct-hire Vietnamese, were unable to perform their work because of enemy attacks, curfews, and strikes. During these periods of civilian absence, the work had to be accomplished by military personnel or left undone. Perhaps the best example of this problem occurred during the Tet Offensive of 1968 when most of the large base areas serviced by civilian forces were subjected to Vietcong attack. The Public Works Department, NSA, Da Nang, experienced a total absence of LNs for 5 days. For the succeeding 10 days attendance never rose above 66 percent.²³ Subsequent to the Tet Offensive the Army's contractor (PA&E) required 16 days to be about 85 percent effective owing to the absence of their LN employees.²⁴ The Air Force facilities maintenance force was not similarly affected because of the readily available military personnel.

(3) It was further necessary to provide sufficient military personnel to ensure adequate supervision, control, and inspection of the maintenance effort on a continuing basis. The Navy, for example, found it effective to integrate the military and civilian forces to the maximum extent possible. This close relationship supplied the management necessary to perform the required tasks and, at the same time, provided knowledgeable military personnel capable of immediately assuming these tasks. A mix of one-third Navy personnel, one-third TCNs, and one-third LNs was determined to be adequate.

6. CONCLUSIONS AND RECOMMENDATIONS

a. Conclusions

(1) The requirements for basic facilities maintenance were not contemplated prior to and during the Vietnam construction buildup (Chapter II, paragraph 2a; and Chapter IV, paragraph 2a).

(2) The supply of materials, equipment, and repair parts was not adequate to fulfill facilities maintenance requirements. Such shortages frequently occurred owing to the relatively low priority of facilities maintenance functions (paragraph 5e).

(3) In 1965 the troop structure of the Services, with the exception of the Air Prime BEEF (Base Engineer Emergency Forces) teams, did not provide for trained facilities maintenance military personnel in the quantity necessary to meet requirements in Vietnam without the mobilization of reservists (paragraph 5c).

(4) A requirement exists in contingency operations for trained military facilities maintenance personnel to provide management and supervision of contractor and civilian maintenance forces and to ensure continuity of required operations in emergency situations. Such essential operations include but are not limited to power generation for combat operations centers, communication facilities, air traffic control facilities, and medical facilities; refrigerated storage; combat-damage repair; and fire fighting (paragraph 5f).

(5) The facilities maintenance contractors mobilized in RVN were extensively utilized even though contingency planning did not recognize the possibility or extent of use. The Republic of Vietnam situation demonstrated the feasibility and desirability of using civilian contractors, under similar circumstances, to augment military personnel for provision of facilities maintenance services (paragraph 5b).

²³ NSA, Da Nang, Point Paper, Maintenance and Operations Contract, 29 November 1968.

²⁴ Office of the Secretary of Defense (Installations and Logistics), Memorandum For Record, subject: Real Property Maintenance Council Meeting, 28 March 1968.

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(6) The requirement for facilities maintenance troop units in areas that are not secure was valid in the Vietnam situation and will exist in future contingency operations (paragraph 5f).

b. Recommendations. The Board recommends that:

(1) The Services provide a sufficient number of military personnel trained in facilities maintenance functions in their active duty structure to provide an adequate nucleus to support contingency operations. The Air Force Prime BEEF concept is one method of accomplishment (BM-2) (conclusion (3)).

(2) Facilities maintenance forces utilized in contingency operations be tailored to ensure continuity of vital operations, such as power generation, water supply, battle-damage repair, fire fighting, environmental control of critical electronic systems, and maintenance of critical petroleum, oil, and lubricants facilities. This tailoring of forces in the enclave areas in a contingency such as Vietnam should provide for a nucleus of military personnel to conduct essential functions during the absence of assigned civilian and/or contractor personnel as a result of civil unrest, labor strikes, or enemy activities and to ensure adequate management and supervision of the facilities maintenance functions. In forward areas, where facilities maintenance forces are subject to substantial interruption by enemy actions, these forces should consist primarily of military personnel in organized facilities maintenance units, such as Prime BEEF, Construction Battalion Maintenance Units, or Utility Detachments (BM-3) (conclusion (4)).

(3) Planning for contingency operations consider utilization of civilian and contract facilities maintenance personnel to the maximum extent feasible. When utilization of facilities maintenance contractor(s) is specified, applicable plans should address the following:

- (a) The size of the contractor force to be employed.
- (b) The number of contractors proposed for employment.
- (c) The assignment of responsibility for contract management, supervision, and administration.
- (d) The locations contemplated for assignment to the facilities maintenance contractors (BM-4) (conclusions (5) and (6)).

CHAPTER V

STATUTORY AND REGULATORY CONSTRAINTS

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STATUTORY AND REGULATORY CONSTRAINTS

1. **AREA OF INVESTIGATION.** One of the unusual features of the Vietnam War has been the application of normal peacetime statutory and regulatory constraints, which have had a considerable effect on the facilities maintenance program. The limitations on approval authority for the use of operations and maintenance (O&M) funds on minor construction projects costing more than \$25,000 and the strictures on approval authority for the alteration and repair of battle-damaged facilities have proved to be a major problem in Vietnam. In this chapter the allocation of O&M funds for facilities maintenance in Vietnam is explored to determine their adequacy. The Armed Services Procurement Regulation 22 is discussed in relation to the service contracts with Pacific Architects and Engineers (PA&E) and Philco-Ford. Sole source contracts and their use in Vietnam are discussed as well as the personnel ceiling constraints and their effect on facilities maintenance.

2. **ADEQUACY OF FUNDS.** The expanding and changing requirements for facilities maintenance resulted in substantial requirements beyond those used as the basis for original budget submittals. To meet additional requirements major reprogramming was necessary at various command levels within each Service and military department. As a result of timely actions in this regard, the availability of funds never imposed any serious limitations on facilities maintenance in Vietnam.^{1, 2, 3, 4, 5, 6}

3. **LIMITATIONS ON MINOR CONSTRUCTION AND REPAIR OF BATTLE DAMAGE.** The facilities maintenance program in Vietnam has not been hindered by the lack of funds to do the job; however, the statutory and regulatory constraints on the use of these funds have caused significant problems in the area of minor construction. (The minor construction requirement, which is an integral part of facilities maintenance, has proved to be very significant.) The was especially true in the early days of the Vietnam buildup when, in fulfillment of extremely urgent requirements, the facilities maintenance resources were performing a much higher ratio of minor construction to maintenance and repair than is the case with normal continental United States (CONUS) peacetime practices.

a. The Chief of Engineers, in a letter to the Deputy Chief of Staff, Logistics, Army, concerning the broader use of O&M funds for transitory construction in operational areas, stated (in part):

". . . There has been a trend since World War II to increase progressively controls on construction of all types--temporary as well as permanent new facilities, alterations, additions, extensions, conversions, etc., with increasing tendencies to require the funding of virtually all construction under the Military

¹Department of the Army, Office of the Chief of Engineers Special Study Group, Total Management of Real Property Maintenance Activities (RPMA), December 1968, p. T-4.

²Office of the Assistant Secretary of Defense (Installations and Logistics) (OASD (I&L)), Memorandum For Record, subject: Real Property Maintenance Council Meeting, 28 June 1966, encl. 1, p. 3; encl. 2, p. 4.

³U. S. Army Audit Agency, Report of Audit, Maintenance and Management of Facilities, Audit Report No. PA-69-26, 22 January 1969 p. 11.

⁴OASD (I&L), op. cit., encl. 2, p. 2.

⁵Public Works Department, Naval Support Activity, Da Nang, "Comptroller's Report," Point Paper for Admiral Husband's Visit, 17 September 1968.

⁶Col. H. W. Grace, Jr., USAF, Chief of Program Control Branch, Directorate of Civil Engineering, Interview, 12 November 1969.

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Construction Appropriation. The general and not supportable impressions of those responsible for approving our programs appears to be that construction in most instances should be considered a capital improvement, subject to amortization, whereas it may in fact be an expense incidental to a military mission in many instances. The result has been delay, considerable effort to obtain project approvals, and a temptation to commanders to bend the regulations to a dangerous degree to obtain facilities support for their mission. ⁷

b. The Chief of Engineer's letter presents the viewpoint of those who are charged with the management and execution of minor construction projects using O&M funds. Another point of view is expressed by the Comptroller of the Army, as follows (in part):

"There can be no question that in recent years there has grown up a large body of limitations, both legislative and administrative, which seriously impede the carrying out of the Army's military mission. At the same time, it must be recognized that these limitations are not the result of legislative whims, or of bureaucratic desire to maintain control over activities of lower echelons. Instead, they result from admitted abuses of construction authority The issuance of a regulation which ignores the existence of these legislative and administrative controls and the reason for their existence is likely to lead to further abuses which can only result in more restrictive control and limitations. It is for these reasons that this office has in the past attempted to gain relief by seeking necessary exceptions and exclusions to meet specific problems, rather than requesting complete removal of limitations upon constructions. ⁸

c. The basic restrictions on project approval authority are contained in sec. 2674 of title 10, U. S. Code, Establishment and Development of Military Facilities and Installations Costing Less than \$200,000; and sec. 2673 of title 10, U. S. Code, Restoration or Replacement of Facilities Damaged or Destroyed.

d. The above-mentioned laws are implemented by several Department of Defense (DOD) directives. Each Service also has its own regulations implementing the DOD directives.

(1) DOD Directive 4270.24⁹ prescribes policy guidance for the programming, review, and reporting of military minor construction projects as authorized. The pertinent parts are as follows:

(a) Paragraph IV. A defines minor construction as projects costing \$200,000 or less.

(b) Paragraph IV. B permits funding of projects costing \$25,000 or less from either O&M or military construction funds.

(c) Paragraph V. A, "Approval Authority," states:

1. No project costing more than \$50,000 shall be authorized without advance approval of the Assistant Secretary of Defense (I&I).

2. No project costing more than \$25,000 shall be authorized without advance approval from the secretary of the military department concerned.

⁷Chief of Engineers, DA, Disposition Form to Deputy Chief of Staff, Logistics, Army, subject: Funding Restrictions on Military Construction, 17 August 1964.

⁸Comptroller of the Army, Comment No. 3 to Chief of Engineers Position Paper, subject: Funding Restrictions on Military Construction, 21 October 1964.

⁹DOD Directive 4270.24, Operations and Maintenance Facilities Program—Minor Construction Program—Programming Review and Reporting Procedures, 30 June 1961.

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(d) Paragraph V. C, "Limitations," provides that projects between \$5,000 (changed to \$25,000 by change 3 of 17 February 1969) and \$200,000 involving repair or alteration estimated to cost in excess of 50 percent of the replacement cost of a complete facility shall not be undertaken without prior approval of the Assistant Secretary of Defense (I&L).

(2) DOD Directive 5126.32¹⁰ provides the authority for the Assistant Secretary of Defense (I&L) to redelegate his approval authority to the Deputy Assistant Secretary of Defense (Properties and Installations) (DASD (P&I)) but did not allow for any further redelegations of approval authority. No exceptions were made for combat damage. The application of this directive to facilities maintenance in a combat zone created a difficult problem in Vietnam. The major difficulty was the requirement for advance approval for undertaking repair or alteration of a facility that incurred combat damage in excess of 50 percent of replacement cost.

e. Various attempts have been made to have the above restrictions eased. The primary attempts were directed to raising the \$25,000 limit on O&M-funded minor new construction. However, these attempts have been submerged in the broader effort to raise the limits for approval of minor new construction in general, whether funded from O&M or military construction funds. Two approaches have been tried: one applicable worldwide and one applicable to only combat zones.

(1) In 1964, the Chief of Engineers, Department of the Army, recommended that a broader use be made of O&M funds by commanders in operational areas for urgent temporary construction.¹¹ In commenting on that proposal, the Comptroller of the Army proposed three alternative drafts of legislation that would have authorized the use of O&M funds for construction of facilities and of buildings costing not over \$300,000 in alternative areas described as follows:¹²

(a) In which military personnel are authorized special pay for duty subject to hostile fire,

(b) In foreign countries designated by the Secretary of Defense as areas in which U. S. forces may be subjected to hostile fire,

(c) In foreign countries designated by the Secretary of Defense.

No specific mention of the \$25,000 limit on O&M-funded minor construction was made, but approval of the legislation would have done away with the problem in such areas. The O&M funds could have been used by either construction or facilities maintenance forces up to the new limits proposed. This proposal never received approval.

(2) At least as far back as 1965, legislation with which all Services have concurred has been proposed to the Secretary of Defense for submission to Congress.¹³ The revisions proposed would:

(a) Raise Secretary of Defense approval authority from \$200,000 to \$300,000.

(b) Raise Department Secretarial approval from \$50,000 to \$100,000.

(c) Raise the limit on the use of O&M funds for minor new construction projects from \$25,000 to \$50,000.

¹⁰DOD Directive 5126.32, Delegation of Authority to Approve the Restoration or Replacement of Damaged or Destroyed Facilities. 22 November 1961.

¹¹Chief of Engineers, DA, op. cit.

¹²Comptroller of the Army, op. cit.

¹³Deputy Chief of Staff (Logistics), Army, Disposition Form to the Army Chief of Legislative Liaison, subject: DOD 89-78 Proposed Military Construction Authorization Act 1967, 8 December 1965.

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These proposals to increase approval authority for minor construction projects and limitations on the use of O&M funds have been partially dictated by the escalation of construction costs since the enactment of legislation in 1956. One of the justifications offered at that time was that construction costs had increased 26 percent during the period 1956 to 1964.^{14,15} Construction costs have continued to spiral upward since these proposals were made in 1965; they were 31 percent by the end of 1969.¹⁶ Construction costs are projected to increase approximately 19.2 percent by the end of 1971.¹⁷ The total increase in construction costs over the cited 15-year period is 76.2 percent; this means that \$44,000 would be required to fund the equivalent of \$25,000 construction accomplished at the time the legislation was passed in 1956.

f. Strict application of cited directives in a combat situation proved to be infeasible at an early date. The following extract from a U. S. Army message exemplifies that such a procedure was clearly unworkable.¹⁸ The message was sent to the Commanding General, U. S. Army, Ryukyu Islands (CG, USARYIS), who had the logistic support responsibility for U. S. Army Forces in Vietnam at that time. The message gave the Commanding General the authority to accomplish construction of ". . . urgently needed field fortifications, such as defensive emplacements, bunkers, security fencing and similar measures of a temporary character in defense areas in Vietnam which are absolutely essential to the operations mission in Vietnam. . . ." using O&M, Army (OMA) funds without a specific dollar limitation. The CG, USARYIS was authorized to redelegate this authority to the U. S. Army Support Command, Vietnam (USASCV), which later became U. S. Army, Vietnam (USARV). Concurrently with this action, the Department of the Army was requested to concur. The Department of the Army concurred by Message 704502 19 February 1965.

g. Another problem peculiar to Vietnam, as noted previously, was the restriction on approval authority for use of O&M funds in the repair of combat-damaged structures if the cost of the repairs exceeded 50 percent of the cost of the structure.

(1) This policy led to major problems during the 1968 Tet Offensive. The OCE Special Study Group observed:

". . . Thus, when an Army airfield operations building was totally destroyed by enemy action, a strict interpretation of regulations indicated that it would have to be rebuilt using Military Construction Army (MCA) funds, which would require lengthy reprogramming and rescheduling and would not provide the replacement facility in time. Only a command decision at the highest theater level finally permitted repair using OMA funds. . . . Several alleged violations of the statutes and regulatory limitations in RPMA operations have already received GAO and Congressional attention. It would appear logical for the appropriate authority to grant blanket permission to repair combat damage with OMA funds regardless of the extent."¹⁹

(2) The problem of repair of battle damage was addressed early, but was never resolved. The subject was discussed and highlighted as a definite problem area by the Army representative at the 28 June 1966 OSD Real Property Maintenance Council Meeting. The

¹⁴Ibid., encl. 2, subject: Proposed Revision of 10 USC 2674, November 1965.

¹⁵McGraw-Hill, Inc., New York, N. Y., Engineering News-Record, Vol. 182, No. 12, March 20, 1969, pp. 92-93.

¹⁶McGraw-Hill, Inc., New York, N. Y., Engineering News-Record, Vol. 183, No. 25, Dec. 18, 1969, p. 79.

¹⁷Ibid.

¹⁸Commanding General, U. S. Army, Pacific, Message to Commanding General, U. S. Army, Ryukyu Islands, subject: Emergency Construction, Vietnam, 16 February 1965.

¹⁹DA, OCE Special Study Group, op. cit., p. 94.

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Army representative further stated that the requirement for advance approval as required by DOD Directives 4270.24²⁰ and 5126.32²¹ should be waived in the case of facilities damaged by combat action in Vietnam.²²

(3) The requirement to submit a formal programming document DD Form 1391 and a certificate of urgency in advance were waived in 1968, and permission was granted to use simplified procedures to obtain advance approval to include electrical transmission of the request.²³ Partial relief to these restrictions came with the publication of change 3 of DOD Directive 4270.24,²⁴ which raised the lower limit of the restriction from \$5,000 to \$25,000. However, the requirement for advance approval by the Deputy Assistant Secretary of Defense (P&I) was not waived by the Secretary of Defense.

h. The project approval limitations had substantial impact on the facilities maintenance program. This was particularly true in the earlier years of the Vietnam buildup, when the bulk of facilities maintenance effort was necessarily devoted to minor new construction. In FY 65 and FY 66, about 80 percent of the Army's facilities maintenance program was devoted to minor new construction. In early 1967, the Air Force was still putting the majority of its effort on minor new construction although it had hoped to put 50 to 60 percent of its efforts on facilities maintenance by April 1967.²⁵ Capt. Merdinger, Public Works Officer, Da Nang, in 1967 commented: "Initially, we found our maintenance forces were used almost exclusively on minor new construction and alteration. There was a gradual shift to maintenance and repair jobs as the major construction effort moved ahead."²⁶

i. With such a large portion of the facilities maintenance effort going to minor new construction and the use of O&M funds for new work that was limited to \$25,000, it was inevitable that a number of actions that could have been considered statutory violations would occur.

(1) The General Accounting Office (GAO) noted a number of projects funded with O&M funds that exceeded the \$25,000 limitation as set forth in the statutes. However, there was undoubtedly much other unauthorized construction that was not highlighted.

(2) The Army has since "regularized" these and other projects subsequently found to be in violation of the statutes by transferring project costs to the Military Construction Appropriations.²⁸

j. The \$25,000 approval authority that the DOD directive gives to the Department Secretaries was delegated to the overseas commander in all Services. This authority was redelegated to the agencies performing facilities maintenance within Vietnam.

(1) Army. In USARV the \$25,000 approval authority for O&M-funded minor construction projects was redelegated to the Commander, 1st Logistical Command (later USAECAV), who in turn partially redelegated \$10,000 approval authority to the support commands and

²⁰DOD Directive 4270.24, op.cit.

²¹DOD Directive 5126.32, op.cit.

²²OASD (I&L), op.cit., p. 4.

²³DA, Message 165240 subject: Battle Damage to Real Property Facilities, 10 April 1968.

²⁴DOD Directive 4270.24, 17 February 1969.

²⁵OASD(I&L), Memorandum For Record, subject: Real Property Maintenance Council Meeting, 31 March 1967, encl. 3 and encl. 3, p. 1.

²⁶Capt. Merdinger, Civil Engineer Corps (CEC), USN, Report on Public Works, Da Nang. (Unpublished NAVFACENGCOM report), 10 July 1968.

²⁷Comptroller General of the United States, Report to the Permanent Subcommittee on Investigations, Committee on Government Operations, U... Senate, Pacific Architects and Engineers, Inc., Operations for Management, Maintenance, and Repair of Property, Republic of Vietnam, 6 January 1969, p. 69.

²⁸Col. H. L. Myron, Corps of Engineers (CE), USA, Interview held in Washington, D.C., 20 August 1969.

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\$5,000 to the subarea commanders. After 1 July 1968, when USAECAV received the facilities maintenance mission, it delegated \$10,000 approval authority to its district engineers and up to \$5,000 to the post engineers.²⁹

(2) Navy. Approval authority up to \$25,000 for the use of O&M funds on minor construction projects was delegated to the Commanders, Naval Support Activity (NSA), Da Nang and Saigon.³⁰

(3) Air Force. Air Force Regulation 85-6 provided the Seventh Air Force with approval authority up to \$25,000 for use of O&M funds for minor construction projects. The same regulation provided approval authority up to \$10,000 to the installation commanders in Vietnam.

k. Conclusions

(1) The \$25,000 statutory limitation in O&M funded minor new construction was unduly restrictive.

(2) The restrictions on repair or restoration of damaged facilities in a combat zone were also unduly restrictive.

4. SERVICE CONTRACTS. The Army and the Navy used the service contract extensively to accomplish facilities maintenance in Vietnam. The Army entered into a service contract with PA&E in FY 64 and has continued this type of contract up to the present. The purpose of the contract was for PA&E to provide facilities maintenance services for USARV. The Navy at NSA, Da Nang, negotiated a cost plus award fee (CPAF) service contract with Philco-Ford in March 1966. The purpose of this contract was to provide certain industrial facilities and a supplementary labor force of skilled third-country nationals (TCNs), which was necessary for the facilities maintenance program. This contract has also continued up to the present. Since these were service contracts, they were within the purview of the Armed Services Procurement Regulation (ASPR) 22, which provides the following information: "A service contract is one which calls directly for a contractor's time and effort rather than a concrete end product. . . ."

a. It further states in paragraph 22-102.1:

"The Civil Service Laws and regulations and the Classification Act lay down requirements which must be met by the Government in hiring its employees, and establish the incidents of employment. In addition, personnel ceilings have been established for the Department of Defense. Except as otherwise authorized by express statutory authority (e. g., 5 USC 3109 as implemented by the annual Department of Defense Appropriation Act--expert and consultant services (see Part 2)), these laws and regulations shall not be circumvented through the medium of 'personal services' contracting, which is the procuring of services by contracts in such a manner that the contractor or his employees are in effect employees of the Government. The contracting officer is responsible for assuring the implementation of this policy by considering the criteria in 22-102.2 before entering into any service contract, and by obtaining a legal opinion in doubtful cases where express statutory authority for a personal service contract is to be invoked."

b. Paragraph 22-102.2 of the ASPR lists the factors that should be considered as well as any others that may be relevant in characterizing services as personal or nonpersonal in nature. These elements are (in part):

(1) The extent that the Government can obtain civil servants to do the job.

²⁹Lt. Col. H. F. Gustafson, CE, USA, Interview by telephone, Fort Belvoir, Virginia, 10 November 1969.

³⁰Secretary of the Navy Instruction 11010.8A, subject: Urgent Construction on Requirements in Support of Southeast Asia Operations: Revised Policy and Procedures For, 12 December 1966.

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(2) The need for the type of service can be reasonably expected to last beyond 1 year.

(3) The extent that the Government specifies the qualifications of, or reserves the right to approve, individual contractor employees.

(4) The extent the contractor employees are integrated into the Government's organizational structure.

(5) The extent that the Government reserves the right to have contractor employees removed from the job for reasons other than misconduct or security.

(6) The extent that the Government provides direction or supervision of contractor employees.

(7) The comparable services are performed in the same or similar agencies using civil service employees.

c. The degree of management of the contractor effort differed between the Army and the Navy.

(1) Army

(a) Until 1 July 1968, technical control of facilities maintenance was exercised through a Contract Operation Division at the 1st Logistical Command co-located with the Contract Management Office (CMO), through the engineers on the staffs of the support commands, and through the Contracting Officer's Representative (COR) located at major installations. The degree of control varied with the number and capability of the CORs. After 1 July 1968, the chain of command began with USAECAV through the district engineer to the post engineer. The post engineer is not a member of the installation staff; he is responsible to his superior, the district engineer, for maintenance of his installation. The post engineer in his role as COR directs the installation manager (contract employee) to accomplish work as required. ^{31, 32}

(b) While facility maintenance was under the 1st Logistical Command, the Army made a deliberate effort to adhere to the provisions of ASPR-22, which applies to service contracts. This meant allowing PA&E to manage its own effort to the maximum extent possible. The transfer of PA&E supervision to USAECAV on 1 July 1968 was much more than a shift from one organization to another, it marked a change in attitude of the Army toward management of the PA&E contract. ³³ The USAECAV became very much involved in the management of the contract. This change was in response to the Assistant Secretary of the Army (I&L), who in his memorandum of 10 January 1968 approving the facilities maintenance procurement plan for FY 69 required that the procurement plan for FY 70 include specific steps for increased supervision and control of the facilities maintenance contract. ³⁴

(c) In the opinion of the Commander, NSA, Saigon, the shift in the responsibility of supervision of the PA&E contract increased the caliber of facilities maintenance that was provided by PA&E. ³⁵

(d) The U. S. Army Audit Agency concluded that the PA&E contract had aspects of a personal services nature. However, an extensive audit evaluation of the possible

³¹DA, OCE Special Study Group, op.cit., pp. T-2 and T-3.

³²U. S. Army Procurement Agency, Vietnam, Procurement Support in Vietnam, 1966-1968, p. 29.

³³Lt. Col. H. F. Gustafson, op.cit.

³⁴U. S. Army Procurement Agency, Vietnam, Procurement Plan, Repairs, and Utilities and Electrical Power Services for Vietnam, FY 70, p. 2.

³⁵U. S. NSA, Saigon, Command Brief, 24 September 1968, p. 21.

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personal services implication was not undertaken because the contracts had been reviewed and approved at the DOD and the DA levels. The Audit Agency also noted that Congress was aware of the nature of the contracts.

(2) Navy

(a) The method that the NSA, Da Nang, used was to spread the contractor employees along with military and LN personnel throughout the shops to receive their work assignments from the shop supervisor. Supervision of the entire project rested with the military. Philco-Ford was responsible for all their employees' services and industrial relations functions. ³⁷

(b) The Navy's contract with Philco-Ford also had aspects of a personal services nature. The facilities maintenance effort in I CTZ has operated as a combined effort involving one-third military, one-third LNs, and one-third contractor personnel. The Public Works Department, Da Nang, supervised the effort together with the Seabee personnel who also performed tasks as a part of the total work force.

(c) The position of NSA, Da Nang, was that this combined operation provided the Navy good control and sound management and has been a key feature in the success of the facilities maintenance program of Public Works, Da Nang. During emergencies, curfews, and alerts, Public Works found that the presence of the LNs and contractor personnel was not reliable; consequently, continuity of operations had to be provided by the military personnel. ³⁸

5. **SOLE SOURCE CONTRACTS.** The sole source aspects of contracts for facilities maintenance purposes in Vietnam have caused considerable interest.

a. The Deputy Assistant Secretary of Defense (P&I) in a memorandum regarding the negotiation of the FY 69 Philco-Ford contract stated (in part): ". . . it is suggested that consideration be given to the possibility of obtaining competition in this case to the extent that this is now feasible and practicable. . . ." ³⁹ This memorandum required submission of a plan to OSD to replace the sole source contract with civil service employees or revising procedures to include competitively bid contracts.

b. Paragraph 3-102c of Armed Services Procurement Regulation states:

"Negotiated procurements shall be on a competitive basis to the maximum practicable extent. When a proposed procurement appears to be necessarily noncompetitive, the purchasing activity is responsible not only for assuring that competitive procurement is not feasible, but also for acting whenever possible to avoid the need for subsequent noncompetitive procurements. This action should include both examinations of the reasons for the procurement being noncompetitive and steps to foster competitive conditions for subsequent procurements, particularly as to the reasonableness of delivery requirements and possible breakouts of components for competitive procurement. Except for procurement of electric power or energy, gas (natural or manufactured), water or other utility services, and procurement of educational services from non-profit institutions, contracts in excess of \$10,000 shall not be negotiated on a noncompetitive basis without prior review at a level higher than the contracting officer to assure compliance with this subparagraph."

³⁶U. S. Army Audit Agency, op. cit., p. 36.

³⁷NSA, Da Nang, Possible Change in Maintenance Service Contract Procedures, 11 September 1968.

³⁸Assistant Deputy Chief of Naval Operations (Logistics), Memorandum, subject: Real Property Maintenance in Southeast Asia, 6 December 1968.

³⁹Deputy Assistant Secretary of Defense (P&I), Memorandum, subject: Real Property Maintenance and Operations in Southeast Asia, 27 March 1968.

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(1) To comply with the DOD guidance that consideration be given to obtaining competition for provision of facilities maintenance, the Army competitively negotiated a service contract for provision of facilities maintenance in the Qui Nhon area in FY 69. Seven bidders submitted proposals and PA&E was subsequently awarded the contract. The Army stated that the Qui Nhon area was the only area in which competition could be used because a sufficient number of military personnel was in the area to assist in case of the disruption of essential services due to the changeover of contractors.⁴⁰

(a) The GAO report commented:

"We found that PA&E had been awarded contract DAJB11-69-C-0013 to provide fiscal year 1969 R&U services in the Qui Nhon area, after submitting what we believe to have been, an unrealistically low proposal. PA&E's proposal contained understatements and omissions of significant cost elements, according to DCAA's evaluation. PA&E's proposal was for \$10.5 million compared with six competing proposals ranging from \$15.2 million to \$20.3 million and a Government estimate of \$20.1 million."⁴¹

(b) The GAO reported concluded:

"The introduction of competition into procurement is generally conceded as bringing about lower costs. However, the award of a contract on the basis of an unrealistically low bid can result in unsatisfactory performance if necessary services are not performed. Accordingly, it is in the best interests of the Government to ensure that prospective contractors include in their proposals the needed resources to perform contract requirements. Incomplete proposals can cause subsequent contract modifications to correct inadequacies resulting from understatements in proposed costs. . . ."⁴²

(2) Although a competitive service contract may bring about lower contract costs in a peacetime atmosphere, many other considerations must be made in an active theater of operations. The provision of facility maintenance services in Vietnam was done under the most trying and arduous circumstances and the Services' position was that changing contractors as a result of a competitive contract was a burden that would not necessarily result in lower costs. The rationale of the Army for the sole source contract for the provision of facilities maintenance services for FY 70 in Vietnam was based on three basic considerations.

(a) The overall cost to the Government would be less for the same level of performance. Additional staffing would be required during the transition period between contractors. Another cost would be the repatriation of U. S. and TCN employees for accrued leave, travel, and per diem costs. Lastly, supervision by the Government of two contractors during changeover would require additional Government personnel to administer the contract.

(b) The requirement for maintaining continuity of facilities maintenance services to support the military mission would be ensured. This was the keystone to the effort. Turning to a new contractor would have introduced the possibility of the disruption of critical services and would require military personnel to be diverted from other tasks.

(c) The possible phase down of U. S. forces made shifting to another contractor inadvisable.⁴³

⁴⁰Comptroller General of the United States, op. cit., p. 65.

⁴¹Ibid., p. 66.

⁴²Ibid., p. 68.

⁴³U. S. Army Procurement Agency, Vietnam, Procurement Plan, Repairs, and Utilities and Electrical Power Services for Vietnam, FY 70, 4 November 1968, p. 46.

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(3) The retention of PA&E on a sole source basis was justified by the Army because of PA&E's long experience in Vietnam.

- (a) The PA&E forces were mobilized and were in place.
- (b) It had experience with LNs and TCNs.
- (c) PA&E had built up a career management work force.
- (d) It had an adequate supporting organization.
- (e) PA&E had a continuity of management assets.⁴⁴

(4) The Navy utilized the Philco-Ford contract employees in a different manner than the Army and PA&E. The Navy used the Philco-Ford contract employees to augment critical skills while retaining supervisory authority.

(5) The rationale for maintaining a sole source contract with Philco-Ford was:

- (a) The contractor's work force augmentation had been successful.
- (b) The contract fees had continually decreased since FY 67.
- (c) The competitive contract was not feasible because of the combat environment.
- (d) The possible phase down in operations due to the peace talks.
- (e) The costs incident to changing contractors.⁴⁵

(6) Justifying the continuation of the facilities maintenance contracts in the combat zone as previously discussed required a great amount of effort on the part of many personnel from level of in-country commands to the military departments.

e. Conclusions

(1) Service contracts made a major contribution to facilities maintenance in Vietnam.

(2) Close contract supervision of such contracts is required for effectiveness, responsiveness, and the avoidance of excessive costs.

6. **CIVILIAN PERSONNEL CEILINGS.** The use of LNs as direct-hire civilian employees to augment facilities maintenance operations in a theater of operations is not unique to the Vietnam conflict. Extensive use of LNs as direct-hire and indirect-hire civilian employees was made during World War II and the Korean War. In Vietnam, however, the civilian personnel ceiling limitations for direct-hire civilian employees proved to be a major constraint.

a. The personnel ceiling limitations within DOD were established by the Secretary of Defense based on guidance from the President and the Bureau of the Budget. These civilian employment ceilings were then apportioned to the military departments and agencies based on their determination of requirements. In the case of the Navy, the personnel ceilings were

⁴⁴U. S. Army Procurement Agency, Vietnam, Procurement Plan, Repairs, Utilities and Electrical Power Services for Vietnam, FY 70, p. 51.

⁴⁵Office of the Chief of Naval Operations for Assistant Secretary of the Navy (I&L), Memorandum, subject: Real Property Maintenance and Operations in Southeast Asia, 6 December 1968, encl. 1.

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then allocated by the Department of the Navy to the major commands, e. g. , COMDT MARCORPS, CINCPACFLT, and NAVFACENGCOM. The major commands then apportioned their share to their subordinate commands.⁴⁶

b. Within DOD, there is a separate limitation on foreign national employment in foreign countries as direct-hire civilian personnel. This limitation, imposed to assist in protecting the balance of payments⁴⁷ and to reduce the introduction of abnormal amounts of piasters into the local economy, loses its effectiveness when the direct-hire civilian employee (foreign national) is supplanted by a contractor employee (foreign national), since the salaries of both represent outflow. The ceiling for civilian employment applies to each direct-hire civilian employee, regardless of pay scale, thus it is the great equalizer; e. g., a GS-14 at the Pentagon counts as one on the same basis as a direct-hire Vietnamese civilian employee at Public Works, Da Nang.

c. The ceiling limitations, at least at the operational level, were separate from funding. For example, the NSA, Da Nang, wanted to hire additional LNs as direct-hire employees; the problem faced was not the funds to pay the salaries of the LNs but rather the ceiling limitations that precluded the hiring required.⁴⁸ This problem was especially frustrating in a combat area where the facility maintenance agency required LN augmentation and had sufficient funds to pay their salaries.

(1) In 1968, in response to COMSERVPAC, the Commander in Chief, Pacific Fleet (CINCPACFLT), requested 1,602 spaces to enable NSA, Da Nang, to hire LNs as direct-hire civilian employees to fill urgently required billets. The Department of the Navy, in turn, requested the spaces from the Office of the Secretary of Defense.⁴⁹ A serious disadvantage is the inherent delays as these requests for spaces must proceed through each layer of command giving justifications at each level, which could take at least 3 months. In the case of Public Works, Da Nang, while this request was proceeding through each level for approval, the lack of these direct-hire civilian personnel seriously hampered the responsiveness of the facilities maintenance mission.⁵⁰

(2) The direct hiring of LNs was in consonance with the policy of the Deputy Assistant Secretary of Defense (P&I), who in a memorandum required the submission of a plan for either replacing the Philco-Ford contract with civil service employees or revising procedures to include a competitive bid contract.⁵¹

(3) It should be noted that contractor employees are not subject to the civilian personnel ceiling limitations, the limiting factor being availability of funds for that purpose. One of the major reasons the Army used a service contract for facilities maintenance in Vietnam was because of the restrictive ceilings on employment of civilian personnel.⁵²

7. CONCLUSIONS AND RECOMMENDATIONS

a. Conclusions

(1) The adequacy of operations and maintenance funds in Vietnam was not a limiting factor insofar as facilities maintenance was concerned (paragraph 2).

⁴⁶ Myron Greenwald, Ceiling Allocation Branch, Civilian Manpower Management Office, Department of the Navy, Interview at the Pentagon, 2 November 1969.

⁴⁷Ibid.

⁴⁸ NSA, Da Nang, Briefing for Rear Adm. Osborn, subject: Local National Hire (VN) Ceiling Restrictions Effect on Public Works, NSA, Da Nang, 21 June 1968.

⁴⁹ Mr. A. Cucinato, Ceiling Allocation Branch, Civilian Manpower Management Office, Department of the Navy, Interview at the Pentagon, 21 November 1969.

⁵⁰ Briefing, for Rear Adm. Osborn, op. cit.

⁵¹ Office of Deputy Assistant Secretary of Defense (P&I), Memorandum for Assistant Secretary of the Navy (I&I) subject: Real Property Maintenance in Southeast Asia, 27 March 1968.

⁵² Comptroller General of the United States, op. cit., p. 82.

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(2) The statutory limitation of \$25,000 applicable to O&M-funded minor new construction projects was unduly restrictive because of the increases in construction costs since the legislative limits were established in 1956 (paragraph 3).

(3) The requirements for advance approval of the Deputy Assistant Secretary of Defense (P&I) and prior notification of the Armed Services Committees of the Congress before major repairs of battle-damaged facilities could be commenced (when the cost of repair exceeded 50 percent of replacement costs) were unduly restrictive in a combat zone (paragraphs 3d and 3g).

(4) Rigid application of provisions of the Armed Services Procurement Regulations regarding the prohibition of personal services contracts was impracticable in a combat zone (paragraph 4).

(5) The use of a sole source contract for facilities maintenance services in Vietnam was dictated by the combat conditions and circumstances that existed at that time and place. Even though Section 3 of the Armed Services Procurement Regulation requires review of a sole source negotiated contract at a level higher than the contracting officer only, much effort was expended at all levels in repeated justification to the Office of the Secretary of Defense of the necessity for continuance of the sole source contracts (paragraph 5).

(6) The civilian personnel ceilings for U. S. direct hire of foreign nationals were highly restrictive insofar as they were applied in Vietnam. These ceilings were not related to the availability of funds at the operating level. The benefits that were intended to be realized from these ceilings, such as reduction of gold flow and control of the effects of abnormal piaster introduction on the local economy, were largely negated by the use of contract hires (local nationals and third country nationals) in lieu of direct-hire employees (paragraph 6).

b. Recommendations. The Board recommends that:

(1) The Office of the Secretary of Defense sponsor legislation (10 USC 2674) to increase the statutory limitation for operations and maintenance funded minor new construction projects to at least \$50,000 (BM-5) (conclusion (2)).

(2) The Office of the Secretary of Defense sponsor legislation (10 USC 2673) to permit the delegation of approval authority to appropriate command levels to replace or restore facilities that have been damaged or destroyed by hostile action or natural calamity in a combat zone. Further, the provisions requiring prior notification of the Armed Services Committees of the Congress in those instances be deleted (BM-6) (conclusion (3)).

(3) The Armed Services Procurement Regulation, Section 3, not be interpreted to require approval at the Office of the Secretary of Defense level in determining whether the sole source or competitive-type negotiated contract for provision of facilities maintenance, in a combat zone, is most appropriate and is in the best interests of the Government. (BM-7) (conclusion (5)).

(4) The provisions of Armed Services Procurement Regulation, Section 22, be amended by the Office of the Secretary of Defense to specifically permit utilization of personal services contracts in a combat zone subject to approval by the responsible component commander (BM-8) (conclusion (4)).

CHAPTER VI
RESPONSIVENESS AND EFFECTIVENESS

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RESPONSIVENESS AND EFFECTIVENESS

1. **AREA OF INVESTIGATION.** This chapter examines the responsiveness and effectiveness of the facilities maintenance effort to meet the needs generated by the construction program and military operations in Vietnam. It addresses the major factors having an impact on the manner in which the provision of facilities maintenance and related services was responsive to user requirements in order to identify areas in which changes can be made to improve responsiveness and effectiveness of the effort.

2. **ANALYSIS**

a. **General.** In the latter part of 1965, the facilities provided were generally a combination of simple expeditionary tent camps and other similar basic facilities. These austere facilities were gradually improved by strongbacking and the installation of wooden flooring. These initial beginnings were evaluated by a former Division Psychiatrist who deployed with the 25th Infantry Division in December 1965 and remained with the division for 7 months.

"Almost no material privation was suffered by the men. Most of them were quickly housed in wood-floor and framed tents with screened walls. The main obstacle to comfortable living was the climate. The initial inescapable heat and dust was replaced by inescapable heat, humidity and mud from late March when rain became a daily or alternate daily phenomenon. Despite the use of thousands of gallons of petroleum products the dust was never conquered even in the rainy season. Daily showers and ubiquitous fans (there never was a breeze) salvaged this situation. . . and all types of electrical conveniences were available. These included fans, refrigerators, television sets, radios and nightly movies. The beneficial effect on morale and presumably on the number of psychiatric casualties, of this remarkable logistical support should not be overlooked. . . ."¹

b. **Minor Construction.** Minor construction is a capability inherent in any facilities maintenance operation. During the early days of the Vietnam buildup, the ratio of minor construction projects to facilities maintenance accomplished by facilities maintenance forces was extremely high in comparison with the normal standards of from 2 to 15 percent. During the buildup the emphasis was on construction of facilities; thus, it was inevitable that facilities maintenance resources would be used for minor construction projects. The Public Works Officer at Da Nang in 1967 explained:

".... Experience in Vietnam showed us that it is an absolute necessity for Public Works to have a construction capability. In many cases, construction forces, for reasons of lack of materials or change in priorities, left jobs '95 percent complete' - and unusable. Public Works had to finish the jobs. In addition, in the stress of wartime planning, something always gets left out in the drawings and the construction forces leave before the customers realize what is missing. . . ."²

¹ Maj. F. D. Jones, MC, USA, "Experience of a Division Psychiatrist in Vietnam," Military Medicine, December 1967, Vol. 132, pp. 1003-1008.

² Capt. C. J. Merdinger, Civil Engineer Corps (CEC), USN, Report on Public Works, Da Nang (unpublished NAVFACENGCOM report), 10 July 1968, p. 11.

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(1) In FY 65 and FY 66 about 80 percent of the Army facilities maintenance resources were devoted to minor new construction.³

(2) The Navy Public Works Officer, Da Nang, indicated that during the early buildup period, the maintenance forces (approximately one-third of the total Public Works personnel) were used almost exclusively on minor new construction and alterations.⁴

(3) During 1966, the Air Force was devoting the majority of its facilities maintenance efforts to minor new construction; however, it planned to reduce this effort to between 40 and 50 percent by April 1967. The Air Force representative indicated that this goal was anticipated to be achieved with a further reduction to a level of 10 to 20 percent by January 1968.⁵

(4) The minor construction capability provides the commander with an organic resource to perform tasks that are important to him, but not of sufficient importance to the overall program to warrant a high priority. This capability worked to the benefit and advantage of the overall facilities program during the buildup years. However, when the construction program was in the latter stages, the resources of facilities maintenance, which became involved in extensive minor construction projects, diluted these resources and was no longer an advantage but rather a constraint to the facilities maintenance program.

c. Discussion of Responsiveness and Effectiveness of Facilities Maintenance. The degree to which the facilities maintenance program in Vietnam was responsive and effective to user requirements is difficult to measure. Any analysis of apparent facilities maintenance shortfalls must be made with due consideration of the size of the program and the complexities of its management. Specific complaints about the lack of responsiveness on the part of facilities maintenance were not liberally documented.

(1) Army. The concept employed by the Army in the provision of facilities maintenance services in Vietnam encompassed the management, operation, and maintenance of the facilities and utilities of U.S. Army, Vietnam (USARV), U.S. Navy elements, other Free World Military Assistance Forces (FWMAF), Military Assistance Command Vietnam (MACV), and advisor elements in II, III and IV Corps Tactical Zones (CTZ).

(a) Day-to-Day Operations

1. Common support for units in II, III and IV CTZ areas was the responsibility of the Army. The Army, in turn, contracted with Pacific Architects and Engineers (PA&E) for the performance of facilities maintenance. Research has not found an abundance of specific complaints. In this regard, the Chairman of the Permanent Subcommittee on Investigations, U.S. Senate, observed: ". . . numerous complaints have been made about poor work performance by PA&E employees. . . (however). . . absence of adequate documentation and records of PA&E makes it difficult to trace back on allegations. . ."⁶ There is very little written evidence to indicate that the level of performance of these services by the contractor was less than satisfactory. The following excerpts from a monthly summary submitted by the Commander, Naval Support Activity (NSA), Saigon, who was responsible for the operations of some 47 naval bases of varying sizes in II, III and IV CTZ, were indicative that the level of performance of the contractor was in need of considerable improvement.

". . . 24 hour trouble call service not available after working hours. . . ."

". . . Response to maint (maintenance) requests such as blocked sewer lines, leaking roofs, road deterioration or mech eqpt (mechanical equipment) is spotty or nonexistent. . . ."

³ Office of The Assistant Secretary of Defense (Installations and Logistics) (OASD) (I&L), Memorandum For Record, subject: Real Property Maintenance Council Meeting, 31 March 1967, encl. 2.

⁴Capt. C. J. Merdinger, op. cit., p. 11.

⁵OASD (I&L), Memorandum For Record, subject: Real Property Maintenance Council Meeting, 31 March 1967, encl. 3.

⁶U.S. Congress, Senate, Chairman of Permanent Subcommittee on Investigations, Committee on Government Operations, Letter to the Comptroller General of the United States, 14 May 1968.

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". . . some jobs such as minor building alterations and small repairs are being done, but a comprehensive maintenance program simply does not exist. . . ."⁷

2. Strenuous efforts were made by 1st Logistical Command to improve the quality of service. In July 1968, after assumption of this responsibility by U. S. Army Engineer Construction Agency, Vietnam (USAECAV), and as a result of its intensive management efforts, the performance of the facilities maintenance contractor showed considerable improvement. The better quality of services was substantiated by the Commander, NSA, Saigon, who had previously been very critical of the facilities maintenance support provided to the naval bases in II, III and IV CTZ. He commented that the change: ". . . subsequently increased PA&E response. . . ."⁸ A former Commanding General of Engineer Troops, Vietnam, commented that under USAECAV, contractor operations were considerably tightened and the function was reasonably well performed in most areas by 1969. 9

(b) Repair of Battle Damage. Facilities that were damaged as a result of enemy action were repaired and placed back into operation in a most responsive manner. Generally, after an attack and the survey of the damage incurred had been made, all the resources on hand were brought to bear on the repair of the damaged facilities. There were instances where damage to facilities was kept to a minimum because of timely and sometimes heroic actions.

1. On 13 January 1969 the airfield at Can Tho was attacked by mortars and rockets resulting in a number of hits on parked aircraft and the refueling area. Several aircraft caught fire and some fires started in the refueling area. The installation fire department, which was manned by contractor personnel, responded and began fighting fires even while the attack was still underway. As a result of the prompt action by the fire department, damage to adjacent aircraft, POL area, and other facilities of the installation was kept to a minimum. 10

2. On 14 March 1969 Headquarters, Advisory Detachment 56, Eakin Compound in IV CTZ, was attacked by enemy mortar fire. The attack began shortly after midnight when four 76mm mortars detonated on the mess hall, resulting in extensive damage to the roof, plumbing, electrical wiring, and the kitchen. The PA&E detachment put a crew to work within the hour to replace the roof and repair and replace damaged wiring and plumbing fixtures. By 1200 hours, that same day, the mess hall was repaired and the kitchen was back to full operation. 11

(c) Constraints on Responsiveness and Effectiveness. The responsiveness and effectiveness of the facilities maintenance effort can be affected by many factors. For example, a person may complain that it took many months to install light fixtures in a mess hall, but he has not taken into consideration that the electricians required to do the task cannot begin until the required materials are available. The first inclination of the user is to blame the facilities maintenance organization, whereas the actual reason for the delay lies elsewhere. The factors that lessened the responsiveness of facilities maintenance provided by PA&E will be addressed in the following paragraphs.

1. A facilities maintenance operation, whether in the United States or in a combat zone, requires shops, storage areas, and billeting facilities. In the case of the facilities maintenance contractor of the Army, the contractor complained that there was a constant, serious shortage of contractor facilities that were to be furnished by the Government. The contractor (PA&E) placed great emphasis on proper facilities from which to operate to

⁷ Commander, NSA, Saigon, Message 171142Z June 1968 to Commander, Service Force, U. S. Pacific Fleet, subject: R&U Support in II, III and IV Corps, May Summary.

⁸ Commander, NSA, Saigon, Command Briefing, 24 September 1968.

⁹ Maj. Gen. D. S. Parker, USA, Debrief Report (U), 14 October 1969 (CONFIDENTIAL).

¹⁰ Lt. Col. H. F. Gustafson, C.E., USA, Interview by telephone at Fort Belvoir, Virginia, 30 December 1969.

¹¹ Ibid.

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perform its mission. The General Manager of PA&E for operations in Vietnam, commented: "A key item in the whole execution of our contract is facilities...."¹²

a. The terms of the contract with PA&E, up to FY 69, prohibited the contractor from engaging in construction projects utilizing military construction (MILCON) funds. The facilities for PA&E were authorized to be constructed using MILCON funds by construction agencies; however, the priority assigned to the construction of the facilities for PA&E was low on the priority list. This restraint caused definite problems when PA&E attempted to construct its required shops, storage areas, and billeting facilities, since PA&E was unable to erect suitable facilities using operations and maintenance (O&M) funds because of the statutory limitation of \$25,000 regarding such funds. In the terms of the FY 69 contract, PA&E was allowed to use MILCON funds for construction of its own facilities on an item-by-item approval basis.¹³

b. The rationale of the Army for prohibiting PA&E from engaging in MILCON funded construction projects was that it would cause a diversion of the facilities maintenance resources, that would result in PA&E becoming another construction element in competition with RMK-BRJ;¹⁴ and that the contractor would not be available to accomplish the primary mission of providing facilities maintenance services.¹⁵

c. The General Manager of PA&E for operations in Vietnam declared: "...Agreed that the command has given PA&E all possible assistance in the way of providing facilities, but the facilities have not been adequate."¹⁶

2. Pacific Architects and Engineers experienced considerable difficulty securing vehicles and other equipment. The contract with the Government specified that the Government would furnish the required quantities of equipment to the contractor. The PA&E complained that the Government-furnished equipment was issued on a low priority. The records of PA&E indicate that as of December 1968 it had only 87 refuse trucks on hand against 145 authorized trucks, 6 sewage tankers as against 66, 11 road rollers as against 32, 8 fork lifts as against 20, and no crash rescue trucks as against 15. The contractor was authorized to make up the shortage of Government-furnished equipment by rental of local equipment, which resulted in exorbitant rental rates being paid in numerous instances for equipment in a poor state of repair.¹⁷ In this regard the Comptroller General of the United States commented: "In our opinion equipment costs to the Government were increased by about \$1 million because of the inability of the Army supply system to provide needed equipment...."¹⁸ The efforts of the facilities maintenance contractor would have been more responsive to user requirements if the required equipment had been furnished to the contractor on a more timely basis. The reasons given by Headquarters, U.S. Army, Pacific (USARPAC), for the equipment needed by the contractor to perform its mission not being provided by the Government in the required amounts or in a more timely manner were:

a. The lack of authority required by the AR 310 series. The AR 310 series establishes the Table of Organization and Equipment (TOE) and Table of Distribution and Allowances (TDA), either of which was the basic authority to request personnel or equipment.

¹² Mr. Thomas Spicknall, PA&E, Briefing, to JLRB, 7 August 1969.

¹³ Lt. Col. H. F. Gustafson, op. cit.

¹⁴ Joint venture of Raymond International of Delaware Inc.; Morrison-Knudsen International Co., Inc.; Brown & Root Inc.; and J. A. Jones Construction Company.

¹⁵ Lt. Col. H. F. Gustafson, op. cit.

¹⁶ Mr. Thomas Spicknall, op. cit.

¹⁷ Ibid.

¹⁸ Comptroller General of the United States, Report to the Permanent Subcommittee on Investigations, Committee on Government Operations, U.S. Senate, Pacific Architects and Engineers, Inc., Operations for Management, Maintenance, and Repair of Property, Republic of Vietnam, 6 January 1969, p. 47.

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b. Delays of many months in getting approval of the TDAs that were submitted.

c. The inability of industry to furnish the required items of equipment. ¹⁹

3. At times there was a considerable shortage of transportation to distribute supplies, personnel, and equipment in support of the facilities maintenance program in Vietnam. Further complicating the movement problem were the low priorities given to facilities maintenance personnel, supplies, and equipment. ²⁰

a. Under the terms of the Army facilities maintenance contract, PA&E was responsible for providing movement of facilities maintenance supplies when Government transportation was not available. The contractor was assigned a low priority for in-country movement of men and material when utilizing Government transportation. This resulted in a great deal of lost time as well as not allowing the contractor the ability to schedule the movement of supplies with some degree of certainty. As the scope of the contractor's work increased, it became more difficult to support sites established in remote areas because of the lack of secure or dependable lines of communications. Accordingly, a dedicated airlift capability was determined to be the only feasible solution to the problem. ²¹ The contractor was authorized to use leased Air Vietnam aircraft on a limited basis under the FY 66 contract and this use was increased under the FY 67 contract. ²²

b. In mid-1968, the contractor (PA&E) procured two transport aircraft (Caribou) to provide an organic capability as an interim measure until more military aircraft was available to handle the needs of PA&E. ²³ These aircraft flew 12-hour schedules 6 days a week to 23 installations. This organic airlift capability greatly improved the resupply capability of the contractor, and waiting time for routine supply and personnel movements were significantly reduced. ²⁴

4. The multiplicity of makes and models, particularly electrical power generators, was a very significant factor that affected the performance of facilities maintenance. The necessity for providing support to the rapidly increasing forces created an urgent need for more equipment than was available. At the same time, equipment requirements were generated by military units providing combat support; thus, available resources were unable to fill the needs of both. It became necessary to resort to many expedient methods to obtain minimum amounts of needed equipment. In some areas the equipment was loaned by TOE units, and in some instances the equipment was borrowed from depot stocks. ²⁵

(2) Navy. The initial concept in I CTZ was that the provision of facilities maintenance services of Public Works, Da Nang, was internal to the NSA, Da Nang. This was later modified in that Public Works, Da Nang, provided the management, operation, and maintenance of facilities and utilities of Marine Forces in secure areas of DaNang, Phu Bai, and Chu Lai. This was later modified to include MACV advisors and airfields in certain nonsecure areas in addition to support of Army units in I CTZ in accordance with an Interservice Support Agreement (ISSA). These amendments resulted in the hotel concept of providing facilities maintenance to defined areas of a fixed scope rather than certain named units.

¹⁹ USARPAC, Fact Sheet, Facilities Engineering (Repairs and Utilities) in USARPAC, 6 October 1969, p. 4.

²⁰ Ibid.

²¹ Mr. Thomas Spicknall, op. cit.

²² Comptroller General of the United States, op. cit., p. 54.

²³ Ibid., p. 55.

²⁴ Mr. Thomas Spicknall, op. cit.

²⁵ U. S. Army Procurement Agency, Vietnam, Procurement Support in Vietnam, 1966-1968, p. 32.

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(a) Day-to-Day Operations

1. Prior to the fall of 1967, limited facilities maintenance services were provided to the 1st Marine Division (1stMARDIV) Headquarters at Da Nang by the combat engineers of the division. By the fall of 1967 the engineering capabilities of the division engineers were needed elsewhere in the 1stMARDIV Tactical Area of Operations (TAOR); consequently, Public Works, Da Nang, as planned, began to assume responsibility for the provision of facilities maintenance services to the Division Headquarters. A former Assistant Division Engineer commented that the degree of responsiveness and effectiveness of these services provided by Public Works, Da Nang, increased from a low point in the fall of 1967 to a high degree of responsiveness and effectiveness by the summer of 1968.²⁶

2. A former Commanding General of the 1st Marine Aircraft Wing (1stMAW) commented: ". . . they (Public Works Center Four) have made the living and working conditions of many Marines more comfortable and enjoyable during their tour."²⁷

3. A former Commanding Officer of the 26th General Support Group, U.S. Army, at Phu Bai explained that in September 1968, when the Army units arrived at Phu Bai, almost all the buildings assigned were in need of repairs and electrical wiring. The NSA, Public Works Detachment, completed the largest phase of the program in 2 months by rehabilitating approximately 1,000 Southeast Asia huts, eight mess halls, and various other buildings.²⁸

4. The former Commanding General, XXIV Corps, expressed amazement that the Public Works detachment in his area was able to meet every requirement regardless of the continual increase in personnel strength during the period June 1968 to June 1969. He commented on its responsiveness and effectiveness as follows:

"I should like to compliment you and your men on the magnificent reaction during the period of enemy attack by fire. Your personnel have always responded immediately despite the dangers involved, and have repaired damaged equipment with such rapidity that no operation has ever been delayed as a result of inadequate facilities."²⁹

(b) Repair of Battle Damage. The repair of battle-damaged facilities was a major Public Works effort. After each attack, Public Works personnel were immediately on the scene and began surveying the damage. The damage assessment was radioed to Public Works, Da Nang, which dispatched the work crews as required. The utility crews went to work immediately restoring the damaged utilities, while the repair crews began airfield, building, and road repair at first light the following morning. During the period, January through August 1968, installations under the umbrella of Public Works, Da Nang, underwent 129 attacks, which required approximately \$1 million in repair.³⁰

1. The use of military personnel was an important factor in providing facilities maintenance during times of stress or in nonsecure areas. Public Works, Da Nang, utilized a ratio of one-third military personnel, one-third Third Country Nationals (TCNs), and one-third local nationals (LNs) in the facilities maintenance work force. The contractual arrangement did not permit placing civilian personnel outside the so-called secure areas of Da Nang, Phu Bai, and Chu Lai. On some occasions, the TCNs refused to work in areas subjected to mortar or rocket attack. In each case, the burden was on the military to provide the

²⁶ Lt. Col. R. C. Jones, USMC, Interview at Washington, D. C., 8 December 1969.

²⁷ Commanding General, 1st Marine Aircraft Wing, Letter to Public Works Officer, Da Nang, 26 January 1969.

²⁸ Commanding Officer, Headquarters, 26th General Support Group, Letter to Commander, NSA, Da Nang, 4 July 1969.

²⁹ CG, XXIV Corps, Letter to Lt. Comdr. R. E. Dearly, USN, 25 June 1969.

³⁰ NSA, Da Nang, Point Paper, For Admiral Husband's Visit, 17 September 1968.

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essential services. During times of attack or threatened attack, civilians could not be required to stay at their post; consequently, total dependence was on the military personnel.

2. On 10 March 1968 the cantonment at Cua Viet in northern I CTZ, sustained a heavy artillery, rocket, and mortar attack. One of the incoming rounds detonated ammunition staged on the LST ramp, which caused a series of secondary explosions resulting in considerable damage to the ramp area. The administrative, messing, communications, and berthing areas also suffered heavy damage, and in many cases buildings were completely destroyed. On 11 March a detail from CBMU 301 at Dong Ha was dispatched to Cua Viet and began immediate clearing operations. The damage to the LST ramp was given the highest priority to re-establish the loading and unloading operations, since this was the main logistic route for the Dong Ha and northern I CTZ area. The LST ramp was reopened for reduced operations by 1300 on 11 March. Repair work was then focused on the cantonment area, consisting of replacement and rehabilitation of approximately 35 buildings. By 18 March, the LST ramp was in full operation and repairs were completed on the cantonment area by 25 March.³¹

(c) Constraints on Responsiveness and Effectiveness

1. The problem encountered in transporting required equipment and supplies for the facilities maintenance was very significant, most particularly in the IV CTZ, where the bulk of the cargo was transported by boats and utility aircraft. These small bases, which were under the cognizance of NSA, Saigon, grew from seven bases in 1966 to 47 bases by 1969; consequently, the resupply of the many isolated bases became a major problem. In addition, the continual shortage of air transportation made it necessary for NSA, Saigon, to have two transport aircraft (C47) as an organic capability to deliver high priority supplies and personnel, some of which were to support the facilities maintenance of the outlying camps. These assigned aircraft did not have a short takeoff and landing (STOL) capability; consequently, NSA, Saigon, depended on Army aircraft to haul high priority supplies to outlying camps with inadequate landing fields.³²

2. In September 1968, NSA, Da Nang reported that the most significant problem facing the activity was the lack of replacement equipment. A large portion of the Civil Engineer Support Equipment was expected to endure only one-half of its life expectancy because of the 7-day, 24-hour working environment. In addition to a multiplicity of makes and models, much of the equipment was obsolete as well as being in poor condition on receipt. The situation was complicated by the fact that Public Works used what the manufacturers considered a 5-year spare parts supply in 1 year. Much of the equipment had been diverted from other CONUS or overseas bases or from the Naval Facilities Engineering Command (NAVFACENGCOM) equipment. In many cases the equipment arrived without the spare parts kits or parts lists; in some cases the parts catalogs were not available.³³ On 30 June 1968, 29 percent of the construction equipment and 47 percent of the cranes were on deadline, and some of the units were on deadline for as long as 6 months. In the case of the 12 track-mounted dozers, Public Works considered itself lucky to have four of the dozers in operable status at one time.³⁴

(3) Air Force

(a) The fulfillment of facilities maintenance requirements for the Air Force in Vietnam was accomplished with considerably fewer problems than experienced by the other Services during the same period. The three primary reasons for this were:

1. The physical characteristics of an air base are relatively uniform and are not subject to relocation.

³¹ Cruise Book, USN Construction Battalion Maintenance Unit 301, Republic of Vietnam '67-'68.

³² Comdr. Finn, USN, Operations Officer, NSA, Saigon, Briefing, to JLRB, 14 September 1969.

³³ Public Works Officer, Da Nang, Letter, to NAVFACENGCOM, 4 September 1968.

³⁴ NSA, Da Nang, Point Paper, For Admiral Husband's Visit, 17 September 1968.

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2. The utilization of Air Force civil engineering personnel (military) in base civil engineering units on a TDY basis and the use of the Prime BEEF teams and the RED HORSE Squadrons.

3. The dependence of the Air Force on a high standard of facilities maintenance to accomplish its mission.

(b) On 30 January 1966, the main body of the 554th Civil Engineering Squadron, Heavy Repair (HR), arrived at Phan Rang Air Base. The unit immediately became involved in extensive maintenance efforts on the AM-2 matting runways and taxiways that had been damaged during aircraft operations and was deteriorating owing to actions of the elements. To keep the runways operational, continuous maintenance was required during the period from May to December 1966. In order not to interfere with combat operations, a schedule was arranged to permit the 554th to have daily access to the runway surfaces for repair purposes during the hours of 1800 to 0600. As a result of the maintenance efforts on the runways and taxiways, no combat operations were canceled. ³⁵

(c) Repair of Battle Damage. The Viet Cong unleashed a devastating artillery attack on the Binh Thuy Air Base on the night of 11 January 1969. The enemy fired in excess of 150 rounds and several parked aircraft were hit and many rounds impacted on the support facilities. The communications center, dispensary, and some of the troop dormitories sustained direct hits. In addition, the electrical distribution system was severely damaged. An assessment of the situation by the base civil engineer indicated that the damaged facilities could be repaired by the in-house forces, but outside assistance was needed to repair the electrical distribution system. On 12 January, electricians from the 823d Civil Engineering Squadron (RED HORSE) arrived and began repairs on the power distribution system. By 14 January, all repairs were complete and the air base was back to full operation. ³⁶

d. Electrical Power Distribution. One of the most vexing facilities maintenance problems in Vietnam was that pertaining to the production and distribution of electrical power. Because of the lack of an industrial base and the consequent shortage of commercial power in-country, it was necessary for the Services to make arrangements to satisfy the bulk of their requirements through Service controlled generating plants and systems. These arrangements were slow in coming to fruition; consequently, initial efforts to solve the problem necessarily resulted in the introduction of small generators of nearly every conceivable size, description, and manufacture. The Commanding General of the U. S. Army Mobility Equipment Command stated in 1965 after a visit to Vietnam: "The U. S. Army faced major problems in generator support unless extraordinary action was taken to forestall them. . . ." ³⁷ The problem of operating and maintaining generators was complicated by the myriad of makes and models in use in Vietnam. The facilities maintenance contractor for the Army (PA&E) was allowed to purchase on a reimbursable basis, a considerable portion of the authorized equipment required for the provision of facilities maintenance services. The General Manager of PA&E for operations in Vietnam observed: "In the early days of the generator procurement program, just about every make and model produced by every manufacturer in the United States and Japan was shipped to Vietnam. . . ." ³⁸ A reliable supply of electrical power in Vietnam was a continuous concern. Uninterrupted electrical power was critically necessary for many operations. The continuous use of high-speed light-duty generators, which were designed for intermittent emergency use to provide primary power, contributed to many headaches. Many of the generators were old and unreliable and required continuous attention. With the lack of generator support at various units, generators were transferred from base to base to fill immediate commitments. One of the basic causes of the electrical problem was that the power requirements far outstripped the Services' capabilities to produce and distribute electrical power. The Services used sophisticated

³⁵Col. J. F. Conti, USAF, Interview by telephone, Hanscom Air Base, Massachusetts, 8 December 1969.

³⁶Capt. R. L. Hodge, USAF, Interview at Washington, D. C., 12 November 1969.

³⁷U. S. Army Procurement Agency, Vietnam, Procurement Plan, Repairs and Utilities and Electrical Power Services for Vietnam, FY 70, 4 November 1968, part B, p. 72.

³⁸Mr. Thomas Spicknall, op. cit.

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machinery in great quantities, which required substantial amounts of electrical power during the entire conflict. The remarkable Post Exchange (PX) system brought luxury appliances such as electric frying pans, toasters, coffee makers, and even room air conditioners to the combat zone. These appliances added to the already incredible load and contributed to an imbalance of the generator loads. A related problem to power generation was electrical distribution wiring, which was performed with all kinds of metallic substances capable of conducting electricity (e.g., barbed wire, communications wire) by unqualified personnel under the guise of the self-help program.³⁹,⁴⁰,⁴¹ Another reason for the generator problem was that the expeditionary generators were not compatible with 24-hour continuous operation.⁴²

(1) Army

(a) The generator problems that the Army units incurred in Vietnam were complicated by the multiplicity of makes, models, and capacities. The base power requirements for U.S. Army forces in Vietnam included a range from 10 to 250 kw and totaled approximately 1200 generators during the FY 69. To expedite delivery of generators to meet urgent requirements in Vietnam, 324 100-kw units were purchased from the Taiyo Company in Japan.⁴³ The procurement of these generators did not alleviate the situation, and in some instances compounded the problem. The generators were procured with a 1-year supply of spare parts as an interim measure and in 1967 a decision was made not to procure repair parts for the Taiyo generators but rather to cannibalize the generators as required and phase them out of the system. However, the generators became inoperable mostly as a result of the failure of the same parts, so cannibalization was ineffective. It was not until the latter part of 1968 that authority was granted to procure repair parts for the Taiyo generators.⁴⁴

(b) Electrical power generation became a very critical commodity. Tactical generators barely sufficed during the early base development, but increasing power demands required continuous use of tactical generators which aggravated the critical power shortage and placed an additional burden on the logistic system for repair parts and replacement generators. In response to the requirements of USARV, T-2 tankers were converted to electric power generator barges. A total of 11 ships were used, five of the ships were capable of producing 3100 kw and six of the ships produced 4300 kw each. Four ships were anchored off Cam Ranh Bay and provided 15 500 kw, two ships at Nha Trang provided 8600 kw, two ships at Qui Nhon provided 8600 kw, and two ships at Vung Tau provided 8600 kw. Initial planning scheduled two ships for Long Binh power requirements, but this became unfeasible because of the requirement for extensive dredging; consequently, a land-based electrical power generation facility was established at Long Binh. In conjunction with the vessel contract, the Vinnell Corporation was awarded a Military Construction, Army (MCA) funded contract in April 1966 to design, procure supplies and equipment for and construct land-based electrical generation and distribution systems at Cam Ranh Bay, Qui Nhon, Nha Trang, Vung Tau, and Long Binh. The MCA contract with the Vinnel Corporation was modified in November 1967 to include the facilities and land line distribution systems at 12 additional sites. These provided a 61,000-kw service capability over approximately 260 miles of primary and secondary power lines.

(2) Navy

(a) Public Works, Da Nang, maintained and managed a generator pool to provide service for I CTZ. This generator pool was formed to supply nontactical 5- to 250-kw 60-cycle power generators to Navy, Marine, and Military Assistance Command (MACV) base areas located in I CTZ. The generators had been accumulated from Marine Corps units, from

³⁹Ibid.

⁴⁰Lt. Col. H. F. Gustafson, op. cit.

⁴¹Lt. Col. R. C. Jones, op. cit.

⁴²Maj. Gen. D. S. Parker, USA, Debrief Report (U), 14 October 1969 (CONFIDENTIAL).

⁴³U. S. Army, Pacific, Fact Sheet, Electric Power in Vietnam, 6 October 1969.

⁴⁴Col. W. B. Wootton, Corps of Engineers (CE), USA (Ret). Interview by telephone, Astoria, Oregon, 23 December 1969.

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generators formerly held by NSA, Da Nang, and from new shipments procured by NAVFACENG-COM and the Marine Corps. An example of the diversity of the generator pool was that as of December 1968 it consisted of 715 generators of 13 different kilowatt capacities.⁴⁵

(b) Public Works, Saigon, also experienced difficulties with the multiplicity of makes and models of generators. Public Works possessed generators that were manufactured by five different companies. A further complication was that the repair parts were not interchangeable between the different makes and models. Repair parts were lacking for these generators, and when ordered the parts were not received in a timely manner. The Public Works Officer lessened the interchangeability problem by assigning a family of generators to a specific area of operations, which helped, but certainly did not solve the generator problem.⁴⁶

(c) The Navy introduced the Mobile Utilities Support Equipment (MUSE) program into I CTZ in response to the electrical requirements in that area. The MUSE consisted of relocatable and expandable power plants consisting of large slow-speed long-life diesel generating units, ranging from 750 to 1500 kw. These units were skid mounted on long heavy steel I-beams that required minimum ground preparation. All the plant equipment was preassembled and tested prior to deployment to Vietnam. As of September 1968 there were 39 MUSE (30, 100 kw) in use in Vietnam. The planned MUSE procurement FY 70 was 12 1500-kw diesel generators.⁴⁷

(d) Three MILCON funded central power generation plants were constructed in I CTZ during the summer of 1967. These plants, consisting of 23 1000-kw units, were located at Da Nang, Da Nang East, and Chu Lai and provided electrical power for the units in those areas.⁴⁸

(3) Air Force. The initial concept in electrical power generation was that the prime and backup electrical power needs could be met by units of 200 kw or smaller. This resulted in a shipment of many makes and models of generators designed primarily for a backup power role. The mushrooming power requirements necessitated a more flexible approach to the problem. In July 1964 the Air Force had 255 units in the 5- to 150-kw range in SE Asia; by January 1966 the number of generators had grown to more than 900. In the large generator area, the Air Force initially relied on 30 to 35 200-kw units to meet their needs. By the end of 1966, the Air Force had 45 200-kw, 140 500-kw, and 44 1000-kw generators.⁴⁹

e. In attempting to evaluate the responsiveness and effectiveness of the facilities maintenance effort in Vietnam, one should consider that it was performed under the most trying and difficult circumstances. It would have been very difficult for anyone connected with either the construction or facilities maintenance program during the buildup years to have been able to comprehend the expanded scope that facilities maintenance services reached by 1969. Another factor that should also be considered is that the two Services, who were the dominant users and therefore became the dominant providers of facilities maintenance services in their areas, had conceptual differences in providing facilities maintenance services.

3. CONCLUSIONS AND RECOMMENDATIONS

a. Conclusions

(1) The provision of facilities maintenance and related services in Vietnam was generally responsive and effective. The performance of facilities maintenance was not a limiting factor in combat operations during the Vietnam conflict (paragraph 2c).

⁴⁵Public Works, Da Nang, Command History, 1 January 1968 - 31 December 1968.

⁴⁶Capt. Castanes, CEC, Public Works Officer, Saigon, Briefing to JLRB, 14 September 1969.

⁴⁷Public Works, Da Nang, MUSE Quarterly Status Report, SEA, 30 September 1968.

⁴⁸NSA, Da Nang, Point Paper, 17 September 1968.

⁴⁹Maj. Gen. R. H. Curtin, USAF, "Air Operations in Vietnam," Air University Review, December 1968, p. 77.

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(2) A valuable organic asset was the minor construction capability of facilities maintenance resources (paragraph 2b).

(3) Facilities maintenance forces were particularly effective in the rapid repair of facilities damaged by combat action (paragraphs 2c (1) (b), 2c(2) (b), and 2c(3) (c)).

(4) Organized military units (Navy CBMUs, Air Force Prime BEEF teams, and Army utilities detachments) provided a high degree of responsiveness to facilities maintenance in Vietnam (paragraphs 2c(2) (b)2 and 2c(3) (b) and Chapter IV, paragraph 5f).

(5) The provision of a more effective and responsive facilities maintenance effort in Vietnam was hindered by the following constraints:

(a) The multiplicity of makes and models of equipment, particularly electrical power generators, was a severe impairment to the facilities maintenance effort (paragraphs 2c(1) (c)4 and 2d).

(b) The efforts of the Army's facilities maintenance contractor would have been more responsive had the Army provided equipment for the contractor as specified in the contract, rather than defaulting on the basis that formal authority for issue was lacking (paragraph 2c(1) (c)2).

(c) The contractor's operations were hampered by contractual restrictions regarding the construction of facilities required to properly perform the mission (paragraph 2c(1) (c)1).

(d) Although the facilities maintenance materials and equipment rarely involved heavy tonnage of cargo, they were often critical to the accomplishment of the facilities maintenance functions. However, they were in competition with higher priority cargoes and sufficient cargo carrying capacity was frequently not left over to take care of facilities maintenance needs for in-country shipment (paragraph 2c(1) (c)2).

(6) The utilities systems utilized in Vietnam were inadequate and inefficient. The heavy demands for electrical power, potable water, and sewage disposal systems had not been foreseen. Experience in the Republic of Vietnam demonstrated that the standards and planning factors used by the Services were grossly inaccurate and in need of revision. Expedited action is needed in the research, development, and production of package utilities systems (paragraph 2d).

b. Recommendations. The Board recommends that:

(1) Major contracts for facilities maintenance services entered into by the Services provide for the maximum use of contractor-furnished equipment unless there is a clear indication that it is more economical for the Government to furnish the equipment and the Government has the capability to do so (BM-9) (conclusion (5) (b)).

(2) The Services, through the Joint Logistics Commanders, make a determined effort to reduce the multiplicity of makes and models of equipment used in support of the facilities maintenance program (BM-10) (conclusion (5) (a)). (See recommendation 6b Chapter IX, Construction Monograph, and recommendation contained in Chapter VII, Supply Management Monograph.)

(3) The review of standards and planning factors by the Construction Board for Contingency Operations include standards and planning factors for utilities systems; the Board place emphasis on research and development in the area of package utilities systems for the generation of electric power, production of potable water, and sewage disposal; and the Services ensure that such package systems are included in stocks of war reserve material (BM-11) (conclusion (5)).

CHAPTER VII

SUMMARY

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CHAPTER VII

SUMMARY

1. OVERVIEW

a. The review of facilities maintenance has included a wide variety of important support and services performed under the functions variously described as repairs and utilities, public works, base maintenance, facilities engineering, and facilities maintenance. The importance of these functions was especially great in the Vietnam conflict because of the relative stability of the main base areas, the large number of outlying bases, the underdeveloped nature of the Republic of Vietnam (RVN), and the frequency of damage to facilities from enemy action.

b. The problems pertaining to base maintenance varied between the Services and their assigned responsibilities.

(1) The Army placed overwhelming reliance on contractors to provide facilities maintenance, since adequate capabilities could not be provided without the call up of reserves. Although adequate support was provided by contract, many problems existed with contract administration, with provision of Government-furnished material and facilities for the use of the contractor, and with transportation priorities.

(2) The role of the Navy in facilities maintenance had not been foreseen. It was found necessary to provide some organic capability for facilities maintenance in support of the scattered bases involved in inshore and river operations. The greatest impact resulted from the long-term deployment of Marines to the I Corps Tactical Zone and the assignment of support responsibilities to the Navy. Though not a part of the original tasking, facilities maintenance functions within the major enclaves were added, first in support of the Marines and then later as tasked for the other Services, along with responsibility for maintaining the outlying airstrips in the area. The requirements were met by a combination of military and contractor capabilities.

(3) Facilities maintenance of air bases by the Air Force proceeded more nearly as planned. The responsibilities were accommodated by initial temporary duty deployment of base civil engineer personnel, later augmented by Prime BEEF (Base Engineer Emergency Forces) maintenance teams and Rapid Engineer Deployable Heavy Operations Repair Squadrons, Engineer (RED HORSE) construction squadrons, which were augmented by local hires.

c. One of the major problem areas was related to equipment that was, in many cases, obsolete or poorly designed for the tasks to be performed in Vietnam. A particular source of difficulty was electrical power, the demands for which far exceeded previous experience. Extraordinarily difficult repair problems were associated with the multitude of makes and models of generators.

d. In addition to providing normal maintenance, facilities maintenance forces (military and contractor) proved invaluable, particularly in the early stages, in providing emergency construction of small, urgently needed facilities. The low dollar constraint on such projects was a serious handicap.

e. Despite deficiencies and all the difficulties encountered, the record shows that both military personnel and contractors performed creditably in satisfying the needs of facilities maintenance in the combat environment of Vietnam.

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1. The succeeding paragraphs summarize the chapters of the monograph that led to conclusions and recommendations. Each chapter summary contains a brief synopsis that highlights the major lessons learned. This is followed by the most significant recommendations that resulted from an analysis and evaluation of the material contained in the various chapters.

2. PLANNING AND READINESS

a. Lessons Learned

(1) During the early days of the RVN buildup, primary emphasis was necessarily directed toward the construction of facilities to support the large influx of troops. Consideration of the maintenance of facilities was thus relegated to a subordinate role, perhaps because the importance of such functions was not recognized.

(2) Planners for future contingencies must recognize the importance of facilities maintenance and must provide maintenance resources capable of satisfying those requirements essential to mission accomplishment.

(3) This study revealed a paucity of information regarding the early recognition of requirements pertaining to the maintenance of facilities. The recognition and development of such requirements to a higher level of visibility during the early stages of the base development planning process would do much to enhance the performance of the facilities maintenance function in any future contingency.

b. Recommendation

(1) Facilities maintenance requirements and adequate resources to fulfill such requirements be identified in the base development plans of logistic annexes to contingency plans. This could be accomplished by modifying the Joint Chief of Staff Memorandum, SM-643-69, Instructions for Base Development Planning in Support of Joint Contingency Operations, to ensure that the following are considered:

(a) Assignment of responsibility for facilities maintenance.

(b) Facilities maintenance resources required to implement the planned facilities maintenance program. These resources include the facilities, maintenance forces (troops, contractors, and local and third-country nationals), and material and equipment to accomplish the facilities maintenance requirements.

(c) Plans for concurrently increasing facilities maintenance forces commensurate with the increase of facilities acquired during the escalation of a contingency operation (BM-1).

3. ORGANIZATION AND BUILDUP OF CAPABILITIES

a. Lessons Learned

(1) The Services were adversely affected by an inadequate continental United States training base in facilities maintenance skills. Strict interpretation of the Department of Defense directive pertaining to the use of military personnel in maintaining CONUS facilities had hindered the development of sufficient resources. As a consequence, the numbers of military personnel in the active military forces who were qualified to perform such functions were grossly inadequate for the tasks that developed.

(2) Most of the Army and Navy personnel qualified in this type of work were in reserve units. The decision not to implement a general mobilization necessitated the use of contractor forces to accomplish a large portion of the facilities maintenance function.

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(3) There were certain advantages in the use of contractor forces. The contractor had a greater degree of success in direct recruitment of personnel than the Services were able to achieve through utilization of the normal civil service channel. The contractor was not subject to the personnel ceilings imposed on the Services, thus he possessed a greater flexibility in expanding to meet increased requirements in a minimum time frame.

(4) These advantages of contractor forces were accompanied by some disadvantages. Principal among these was the need for military maintenance units at outlying bases and the matter of continuity of essential operations. During periods of tension, such as the civil disorders of 1966 and the Tet Offensive of 1968, many employees could not report to work because of the curfews established by the local government. This fact alone substantiates the requirement that there must be a nucleus of qualified military personnel to provide supervision and continuity of essential operations during such periods. It must be assumed that in future conflicts, despite the Republic of Vietnam experience, the enemy may be able to successfully attack installations from which support services, such as facilities maintenance, are provided. Therefore, the use of a completely civilianized force to provide such services would be infeasible.

(5) When one considers such services as electrical power generation and distribution and water for messing, drinking, and sanitation purposes, both of which are provided by the facilities maintenance forces, it was quite apparent that continuity of these essential services is of prime importance. Even in the major enclaves, total dependence on civilian personnel who were subject to local laws and military restrictions proved to be ineffective. Consequently, base development planners should consider two alternatives, i.e., a total military force or a military and civilian mixed force, as the situation dictates.

b. Recommendations

(1) The Services provide a sufficient number of military personnel trained in facilities maintenance functions in their active duty structure to provide an adequate nucleus to support contingency operations. The Air Force Prime BEEF concept is one method of accomplishment (BM-2).

(2) Facilities maintenance forces utilized in contingency operations be tailored to ensure continuity of vital operations, such as power generation, water supply, battle-damage repair, fire fighting, environmental control of critical electronic systems, and maintenance of critical POL facilities. This tailoring of forces in the enclave areas in a contingency such as Vietnam should provide for a nucleus of military personnel to conduct essential functions during the absence of assigned civilian and/or contractor personnel as a result of civil unrest, labor strikes, or enemy activities and to ensure adequate management and supervision of the facilities maintenance functions. In forward areas, where facilities maintenance forces are subject to substantial interruption by enemy actions, these forces should consist primarily of military personnel in organized facilities maintenance units, such as Prime BEEF, Construction Battalion Maintenance Units, or Utility Detachments (BM-3).

(3) Planning for contingency operations consider utilization of civilian and contract facilities maintenance personnel to the maximum extent feasible. When utilization of facilities maintenance contractor(s) is specified, applicable plans should address the following:

- (a) The size of the contractor force to be employed.
- (b) The number of contractors proposed for employment.
- (c) The assignment of responsibility for contract management, supervision, and administration.
- (d) The locations contemplated for assignment to the facilities maintenance contractors (BM-4).

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4. STATUTORY AND REGULATORY CONSTRAINTS

a. Lessons Learned

(1) The statutory limitations on the use of operations and maintenance funds for minor new construction projects were unduly restrictive and were not compatible either with the construction cost escalation that had occurred since the legislation was enacted in 1956 or with the requirements of a combat zone.

(2) Of particular interest was the statutory requirement that prior notification must be furnished the Congressional Armed Services Committees before restoring or replacing facilities in a combat zone that have been heavily damaged or destroyed as the result of hostile or other action.

(3) It was necessary to go to what were in essence service contracts because of the difficulties encountered in recruiting qualified facilities maintenance workers through the civil service process and the necessity to stay within established personnel ceilings. Strict application of the Armed Services Procurement Regulations provisions relating to personal services aspects of service contracts was impracticable in a combat environment.

(4) With respect to the matter of contract management, the sheer magnitude of the task dictated that engineer elements of the Services become deeply involved in management and supervision of contractor forces.

b. Recommendations

(1) The Office of the Secretary of Defense sponsor legislation (10 USC 2674) to increase the statutory limitation for operations and maintenance funded minor new construction projects to at least \$50,000 (BM-5).

(2) The Office of the Secretary of Defense sponsor legislation (10 USC 2673) to permit the delegation of approval authority to appropriate command levels to replace or restore facilities that have been damaged or destroyed by hostile action or natural calamity in a combat zone. Further, the provisions requiring prior notification of the Armed Services Committees of the Congress in those instances be deleted (BM-6).

(3) The provisions of the Armed Services Procurement Regulation, Section 22, be amended by the Office of the Secretary of Defense to specifically permit the utilization of personal services contracts in a combat zone subject to approval by the responsible component commander (BM-8).

5. RESPONSIVENESS AND EFFECTIVENESS OF FACILITIES MAINTENANCE

a. Lessons Learned

(1) The execution of the facilities maintenance function in the Republic of Vietnam was plagued from the beginning with shortages of equipment and repair parts. Such shortages were attributable, in part, to a low priority placed on facilities maintenance matters, to the inability to forecast requirements to meet future needs because of the rapidly escalating force structure to be supported, and to the proliferation of makes and models of equipment such as electrical generators, engineer construction equipment, and materials handling equipment.

(2) The primary problems caused by the proliferation of makes and models were the lack of interchangeability of parts and the inability of supply systems to provide repair parts for low density equipment in a timely fashion.

(3) Reduction of the multiplicity of makes and models of equipment should be accomplished to the maximum feasible extent throughout the Services. Owing in large part to

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the urgency of the requirement in the early buildup period of any future contingency, it can be assumed that equipment from all sources will be assembled and shipped, as in the case of the Republic of Vietnam, to the objective area. Such actions, although necessary, cause many problems if some degree of standardization has not been achieved.

(4) In addition, utilization of the minor construction capabilities of organic facilities maintenance forces by those commanders fortunate enough to have such forces enabled them to obtain urgently needed facilities in a time sensitive manner.

b. Recommendations

(1) The Services, through the Joint Logistics Commanders, make a determined effort to reduce the multiplicity of makes and models of equipment used in support of the facilities maintenance program (BM-10). (See Chapter IX, Construction Monograph, and recommendations contained in Chapter VII, the Supply Management Monograph.)

(2) The review of standards and planning factors by the Construction Board for Contingency Operations include standards and planning factors for utilities systems; the Board place emphasis on research and development in the area of package utilities systems for the generation of electric power, production of potable water, and sewage disposal; and the Services ensure that such package systems are included in stocks of war reserve material (BM-11).

LIST OF ACRONYMS AND ABBREVIATIONS

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LIST OF ACRONYMS AND ABBREVIATIONS

AR	Army Regulation
ASD (I&L)	Assistant Secretary of Defense (Installations and Logistics)
ASPR	Armed Services Procurement Regulations
BCE	base civil engineer
CBMU	Construction Battalion Maintenance Unit
CE	Corps of Engineers
CEC	Civil Engineer Corps
CGFMFPAC	Commanding General, Fleet Marine Force, Pacific
CINCPAC	Commander in Chief, Pacific
CINCPACFLT	Commander in Chief, U. S. Pacific Fleet
CMO	Contract Management Office
CNO	Chief of Naval Operations
COA	Comptroller of the Army
COMNAVFORV	Commander, Naval Forces, Vietnam
COMSERVPAC	Commander, Service Forces, U.S. Pacific Fleet
COMUSMACV	Commander, U. S. Military Assistance Command, Vietnam
CONUS	continental United States
COR	Contracting Officer's Representative
CPAF	cost plus award fee
CTZ	Corps Tactical Zone
DA	Department of the Army
DASD (P&I)	Deputy Assistant Secretary of Defense (Properties and Installations)
DCAA	Defense Contract Audit Agency
DMZ	Demilitarized Zone

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DOD	Department of Defense
DOICC	Deputy Officer in Charge of Construction
FOUO	For Official Use Only
FWMAF	Free World Military Assistance Forces
FY	Fiscal Year
GAO	General Accounting Office
HAC	Headquarters, Area Command
HSAS	Headquarters, Support Activity, Saigon
ISSA	Interservice Support Agreement
JCS	Joint Chiefs of Staff
kw	kilowatt
LN	local national
LST	landing ship, tank
MAAG	Military Assistance Advisory Group
MACV-DC	Director of Construction, Military Assistance Command, Vietnam
MAF	Marine Amphibious Force
MC	Medical Corps
MCA	Military Construction, Army
MILCON	military construction
MUSE	Mobile Utilities Support Equipment
NAVFACENGCOM	Naval Facilities Engineering Command
NCC	Naval Component Command
NSA	Naval Support Activity
OASD	Office of the Assistant Secretary of Defense
OCE	Office of the Chief of Engineers
OICC	Officer in Charge of Construction
O&M	operations and maintenance
OMA	Operations and Maintenance, Army
OSD	Office of the Secretary of Defense
PACAF	Pacific Air Forces

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POL	petroleum, oil, and lubricants
PA&E	Pacific Architects and Engineers
Prime BEEF	Base Engineer Emergency Forces
PW	Public Works
PX	Post Exchange
RED HORSE	Rapid Engineer Deployable Heavy Operations Repair Squadrons, Engineer (Civil Engineering Squadrons (Heavy Repair))
RPMA	real property maintenance activities
R&U	repair and utilities
RVN	Republic of Vietnam
SE Asia	Southeast Asia
SECNAV	Secretary of the Navy
TAOR	Tactical Area of Responsibility
TCN	third-country national
TDA	Table of Distribution and Allowances
TDY	temporary duty
TOE	Table of Organization and Equipment
USAECAV	U. S. Army Engineer Construction Agency, Vietnam
USAPAV	U. S. Army Procurement Agency, Vietnam
USARJ	U. S. Army, Japan
USARPAC	U. S. Army, Pacific
USARV	U. S. Army, Vietnam
USASCV	U. S. Army Support Command, Vietnam
USARYIS	U. S. Army, Ryukyu Islands
USC	United States Code
VDP	Vehicle Deadlined for Parts
VN	Vietnam

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